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ROYAL BOTANIC GARDENS, KEW

XXXIV.—NEW TREES AND SHRUBS FROM TROPICAL AFRICA. J. BURTT DAVY & A. C. HOYLE.

Increasing interest is being taken in the commercial timbers of the British Empire. Before we are in a position to record the actual or even the potential commercial value of the tropical forests of the British Colonies, and to frame a sound policy for their future management, it is necessary to ascertain of what these forests are composed; in other words we must take a census of the trees, as to the number of kinds represented, the relative abundance of each, what qualities they possess, and to what uses they can be put.

There has been a growing realisation by the British Colonial Governments of the need for taking stock of their timber resources. In this they have the warm support of the Colonial Office, and active Forest Services have been built up, comprising men keenly alive to the needs of the situation. In the last three years there has been a remarkable increase of activity on the part of Forest Officers in the collection of botanical specimens from the areas under their control, resulting in a great increase in the amount of material sent home for identification.

The number of tree-species known from each colony is increasing rapidly, and among them numerous species new to science are coming to light. *Chidlowia*, a new genus from the Gold Coast, new species of *Bersama* and of *Ocotea* from Kenya Colony, and a new species of *Mouriria* from Trinidad, all four discovered by Forest Officers, were described recently in the pages of the *Kew Bulletin*.

The present paper describes a new genus and thirteen new species of tropical African woody plants (trees and shrubs) sent by Forest Officers to the Imperial Forestry Institute for identification. These include: five species from the Gold Coast, four collected by Mr. Chidlow Vigne and one by Mr. W. T. S. Brown; two from Nigeria collected by Mr. J. D. Kennedy; one from the Cameroons collected by Mr. A. T. Johnstone; one from Northern Rhodesia collected by Mr. D. Stevenson and others; one from Tanganyika Territory collected by the late Mr. C. Grey; and three from Kenya collected by Mr. C. W. Elliott, Mr. E. Battiscombe, and Mr. H. G. Deakin.

Carpolobia caudata *Burtt Davy*, sp. nov. [Polygalaceae]; frutex ramuli tenuibus virgatis, foliis oblanceolatis, *C. albae* affinis sed floribus minoribus, foliis angustioribus conspicue caudato-attenuatis, differt; a *C. lutea* sepalis inaequalibus recedit.

A shrub 6 ft. high; *branchlets* slender, virgate, slightly flexuose, green to brownish, puberulous. *Petiole* about 2 mm. long, puberulous; leaf-blade 4.5 to 14.5 cm. long, 1.7 to 3.8 cm. broad, oblong-lanceolate to oblanceolate, caudately attenuate; acumens up to 2 cm. long, sharply pointed, mucronate; base cuneate or sometimes rounded; upper surface dark green, finely and prominently reticulate; both surfaces glabrous except on the midrib; midrib slender, impressed above, prominent and puberulous beneath; main secondary nerves rather distant, not well differentiated, anastomosing about 5 mm. from the margin, connected by loops reaching to within 2 mm. of the margin. *Inflorescence* axillary, racemose, 1.5 cm. long, 2-5-flowered; axis and pedicels puberulous; bracteoles 1 mm. long, subulate; pedicels 2 mm. long. *Sepals* 3 mm. long, lanceolate, thinly puberulous, densely ciliate. *Petals* villosely ciliate in the lower part; median petal galeate, 1×1 cm.; upper petals 10 mm. long, 1.5 mm. broad. *Stamens*; filaments united for $\frac{1}{3}$ their length, 1.2 cm. long. *Ovary* glabrous, 3-locular, ovules solitary in each locule. *Fruits* not seen.

WEST TROPICAL AFRICA. Gold Coast: Kwahu Prasu, Feb. 1929, C. Vigne, Gold Coast Forest Herb. 1619, type in Kew Herb.—Forming undergrowth in high forest.

Allied to *C. alba* Don, from which it differs in the smaller (up to 1 cm. long) flowers, the longer, narrower, caudately attenuate leaves, and the distance from the leaf-margin of the arcuately connected nerves. It approaches *C. lutea* Don in the keel of the corolla, but differs in the very unequal sepals, and in the leaves.

Acioa Johnstonei Hoyle, sp. nov. [Rosaceae], a congeneris inflorescentia et foliis infra longe setoso-pilosis, bracteolis conspicue glanduloso-ciliatis, valde distincta.

A small tree. *Branchlets* terete, dark reddish brown, at first setose-pilose with spreading hairs. *Stipules* small, caducous; petiole 2-3 mm. long, stout, transversely rugose, setose-pilose at first. *Leaves* alternate, coriaceous, 5.5-9 cm. long, 1.7-4 cm. broad, ovate-elliptic to lanceolate; apex gradually and acutely acuminate; base rounded or very broadly cuneate; upper surface glaucous, shining, reticulate, more or less dotted with pitted tubercles; lower surface less glaucous, scarcely shining, with long spreading setose hairs arising from basal tubercles chiefly on nerves and veins, and on the prominent, reddish midrib. *Panicles* axillary and terminal, subcorymbose, 5-8 cm. long, pedunculate or with a flower arising from the axil of a bract near the base, the branches 1-3-flowered, cymose, the rhachis, branchlets, pedicels and calyces more or less densely covered with long spreading setose hairs in addition to a fine dense pubescence; bracts and bracteoles 3-4 mm. long, ovate, pubescent, the apex and margin furnished with conspicuous long-stipitate capitate glands; pedicels 1.0-1.7 cm. long, with two bracteoles about the middle, which may bear in their axils 1 or 2 additional flowers. *Calyx-tube* 8-9 mm. long, 0.5-1 mm. wide at the



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Carpolobia caudata Burt Davy. 1. Flowering Branch, $\times \frac{1}{2}$. 2. Leaf, showing lower surface, $\times \frac{1}{2}$. 3. Branchlet with buds. 4. Flower, $\times 1\frac{1}{2}$. 5. Vertical section of flower, $\times 1\frac{1}{2}$. 6. Flower-bud, $\times 1\frac{1}{2}$. 7. Stamen, $\times 3$. 8. Cross-section of ovary, $\times 4$.

slightly swollen base, narrowly infundibuliform, expanding towards the mouth; lobes 5, imbricate, 4-5 mm. long, 2-2.5 mm. broad, oblong, obtuse, slightly unequal in length, sericeous within. *Disc* lining the calyx-tube, villose below the mouth with downwardly-directed setose hairs, the margin shortly free, irregularly crenate, glabrous. *Petals* 5, obovate-orbicular membranous, white (?), prominently palminerved, glabrous, scarcely as long as the calyx-lobes in bud, deciduous at flowering. *Stamens* about 20, glabrous; filaments united for 1.5 cm. of their length in a strap-shaped bundle, which is attached to the disc opposite one of the calyx-lobes, and curved inwards in bud, the free part of the filaments filiform, 8-10 mm. long; anthers medifixed, versatile, orbicular-oblong, 0.5 mm. long and broad. *Ovary* seated at the mouth of the calyx-tube at the base of the staminal bundle, white-tomentose, with a conspicuous tuft of setose hairs directed downwards from its base; ovules 1-2, pendulous from near the apex; style arising from the inner side of the base of the ovary, filiform, tapering, 3 cm. or more long, exserted beyond the staminal bundle; stigma minute, peltate. *Fruit* not seen.

WEST TROPICAL AFRICA. British Cameroons: Bamenda Division, at Bum, *A. T. Johnstone* 74/31, type in Kew Herb. A small tree in orchard bush. Altitude 5000 ft., fl. Jan. 1931.

Vernacular name (Bamenda): "Tileelee."

***Dichapetalum kumasiense* Hoyle, sp. nov.** [Chailletiaceae]; affinis *D. beniensi* Engl., a qua floribus majoribus, nervis lateralibus foliorum infra minus prominentibus, foliis latioribus acumine brevior et basi rotundatis, differt.

A straggling *shrub*. *Branchlets* slender, clothed like the buds and youngest leaves, with greyish-fulvous woolly tomentum. *Stipules* subulate, tomentose outside, persistent, 3-4 mm. long. *Leaves* alternate, thinly chartaceous, 5-9 cm. long, 2.5-4.5 cm. broad, ovate or elliptic, acute or gradually and very shortly acuminate, with a hairy mucro, shortly narrowed to the rounded or subauriculate base; upper surface dark green, with midrib impressed and remaining pubescent, lower surface distinctly lighter in colour, densely pubescent on the midrib and nerves, and pubescent on the very finely reticulate veins; lateral nerves 6-9 pairs, arcuately ascending, delicately and repeatedly looped near the margin; petiole 2-3 mm. long, densely woolly-tomentose. *Flowers* few together in axillary fascicles, subsessile. *Sepals* 5, ovate-elliptic, obtuse, 4 mm. long, densely tomentose outside, glabrous within. *Petals* 5, oblanceolate, glabrous, 5 mm. long including the long claw; limb about 2.5 mm. long, divided to the middle, each lobe concave, subacute. *Anthers* ovoid, 5 mm. long, on glabrous filaments 4 mm. long which become broader and flattened towards the base. *Ovary* superior, depressed-globose, 3-locular, 1 mm. in diameter, densely silky; style 4.5 mm. long, glabrous; stigma deeply divided into 3 spreading lobes. *Fruit* not seen.

WEST TROPICAL AFRICA. Gold Coast : Kumasi, *C. Vigne* 1635, type in Kew Herb. Straggling shrub in secondary forest. Altitude 900 ft. Fl. March, 1929.

Dialium reticulatum *Burtt Davy et MacGregor*, sp. nov. [Caesalpinaceae] ; affinis *D. Holtzii* Harms, a qua ramulis novellis puberulis, foliolis paucioribus minoribus obtusis, calycis lobis subaequalibus, recedit.

A spreading tree up to 50 ft. high (*Battiscombe*). Young branchlets smooth, puberulous, brown, with numerous small distinct lenticels. *Stipules* caducous. *Leaves* alternate, imparipinnate, 4.5–11.5 cm. long ; petiole 1–1.7 cm. long, greyish puberulous, rhachis up to 4 cm. long ; petiolules 2 mm. long, stout, puberulous ; leaflets opposite or subopposite or rarely alternate, 1.5–5 cm. long, 0.8–3 cm. broad, broadly ovate-elliptic, glabrous on both surfaces except on the midrib below, veins prominently reticulate and pustulate ; base rounded to subcordate, or the terminal one cuneate ; apex obtuse, acute or rounded ; margin entire, minutely ciliolate with crisped hairs ; lateral nerves 5–7 pairs, prominently arcuate well within the margin. *Panicles* axillary and terminal, laxly branched, pedunculate, up to about 13 cm. long, branches up to 4 cm. long. *Flowers* rather numerous, cream-coloured, with two caducous bracteoles on the 2–3 mm. long pedicels. *Calyx* shortly gamosepalous, the tube lined by the large flat disc, the lobes 5, imbricate, subequal, 2.5 cm. long, oblong-ovate, deciduous, leaving the disc attached below the fruit. *Corolla* 0. *Stamens* 2, opposite two adjoining sepals, arising on the margin of the disc ; filaments short, inflexed in bud ; anthers nearly 1.5 mm. long, basifixed, thinly puberulous, oblong, opening by short pore-like apical slits, one locule apiculate. *Ovary* shortly stipitate, ovoid, 1.5 mm. long ; ovules 2, pendulous ; style 3 mm. long, filiform, stigma small, truncate. *Fruit* 1-seeded, ovoid, about 1.5 cm. long and 1 cm. broad, dark reddish-brown, minutely greyish-puberulous, arising on a stipe about 2.5 mm. long from the persistent combined disc and calyx-tube ; epicarp forming a thin brittle shell, mesocarp chestnut-brown, mealy, persisting on the thin leathery endocarp. *Seed* laterally compressed, up to 8 mm. long and 5 mm. broad, greyish-yellow, shining, striate with slightly raised veins from the hilum, pendulous by a slender raphé from the apex.

TROPICAL AFRICA. Kenya Colony : Mida, coastal region, *C. W. Elliot*, Forest Herb. 167 ; 1489, type in Kew Herb. ; Njomboni, coastal region, *E. Battiscombe* 802 ; Arabuko, Malindi Dist., *R. M. Graham* 377 ; "Coast District," *C. W. Webber* 613 ; Bush lands, Kiyangwe-Wanga Road, Lamu District, *Mohammed Abdula* 2200.—Fl. September ; fr. March.

Vernacular name (Swahili ; Lamu) : "mPepeta."

"Small tree, 25 ft. Stems white ; bark fairly smooth. Flowers greenish-white and scented. Fruits red, $\frac{1}{2}$ " diam., edible," *Mohammed Abdula*. The fruit and the largest leaflets are described from Mr. Battiscombe's specimen.

Ostryoderris Brownii *Hoyle*, sp. nov. [Papilionaceae]; affinis *O. leucobotrya* Dunn, sed ovario in sutura superiore pubescente, ceterum glabro neque ferrugineo-tomentoso, calyce mox glabrescente, paniculis latioribus, foliis anguste oblongis apice gradatim acuminatis nec breviter oblique caudatis, nervis lateralibus pluribus tenuissimis indistinctis, ramulis novellis vix lenticellatis differt.

A small tree. *Branchlets* at first purplish-ferruginous-tomentose, soon glabrous, with light grey bark; *buds* scarcely flattened, ferruginous-strigose. *Leaves* imparipinnate, up to 35 cm. long, petiole and rhachis very sparsely ferruginous-pilose, almost glabrous, channelled, petiole pulvinate, 3.5–5.5 cm. long; rhachis 12–21 cm. long, with tufts of hairs at the base of the petiolules; stipels subulate, 1–2 mm. long, subsistent; leaflets 6–7-jugate, 5.5–12 cm. long, 1.8–3.7 cm. broad, coriaceous, dark green when fresh, glabrous, elliptic to narrowly-oblong or lanceolate, gradually acuminate; acumen obtuse or emarginate; base cuneate to rounded; margin subrevolute; upper surface shining, with midrib impressed and lateral nerves indistinct; lower surface dull, with midrib prominent, the 10–12 pairs of lateral nerves subprominent, doubly looped near the margin, with lax reticulation between; petiolules 2.5–4 mm. long, rugose. *Panicles* axillary and terminal, pyramidal, ferruginous-tomentose, the terminal one branched twice, about 20 cm. long and broad, lower branches spreading, the branchlets bearing numerous flowers on short (1.5 mm. long) ferruginous pedicels. *Calyx* purplish-black when dry, turbinate, 4 mm. long and broad, glabrescent, the 5 very broad and short triangular lobes densely ciliate, especially at the apex. *Petals* glabrous; standard orbicular, 1.2–1.3 cm. across, base cordate, apex emarginate; claw about 3 mm. long; wing-petals free from the keel, 1.3 cm. long including the claw; keel-petals 1.2–1.3 cm. long. *Stamens* diadelphous, tube and filaments glabrous 1.3 cm. long, vexillary stamen free to the base; anthers dorsifixed, narrowly elliptic-oblong, 1 mm. long. *Ovary* bearded on the upper side, 5 mm. long, borne on a stipe of equal length; style curved, glabrous; stigma truncate, minutely hairy. *Pod* not seen.

WEST TROPICAL AFRICA. Gold Coast: Jema, W. T. S. Brown 2163, type, in Kew Herb. Tree 25 ft., in savannah; dark green foliage; pinkish flowers. Fl. Feb. 1931.

Pterocarpus Stevensonii *Burt Davy*, sp. nov. [Papilionaceae]; affinis *P. Antunesii* Harms, sed inflorescentiae rhachide, calyce et foliolis infra pubescentibus, foliorum rhachidibus adpresso-pubescentibus, petiolis pedicellisque brevioribus, foliolis majoribus, differt.

A small, much-branched deciduous tree; bark of *branchlets* faintly ribbed, pruinose, puberulous when young. *Leaves* 6–10 cm. long, imparipinnate, 1–3-jugate; rhachis appressed-puberulous; leaflets opposite, elliptic to ovate-elliptic, rounded to obtuse, slightly emarginate at apex, with a minute mucro, rounded at base,

minutely pubescent above and beneath, 2.5-4 cm. long, 1.5-2 (rarely 2.5) cm. broad, prominently and closely reticulate; lateral nerves about 12 pairs; petiolule 2 mm. long. *Racemes* axillary, about equalling the subtending leaves, 15- to 20- or more- (rarely fewer-) flowered; rhachis and pedicels appressed-puberulous; pedicels filiform, 1 cm. long. *Calyx* appressed-puberulous, 5 mm. long; lobes shallow, rounded, pubescent within, ciliate. *Corolla* yellow; standard about 1.5 cm. long. *Ovary* pilose. *Fruits* obliquely obovate, winged all round, strongly reticulate, about 3.5 cm. long, 2.5 cm. broad, light grey-brown in colour, minutely pubescent.

SOUTH TROPICAL AFRICA. N. Rhodesia: Siburu Teak Forest, about 70 miles west of Livingstone, on sand-veld, fruiting 26 February, 1929, *Duncan Stevenson* 2; *Burt Davy* 20,574. S. Rhodesia: Victoria Falls? "a yellow-flowering tree," "all over the veld," fl. Nov. and Dec. *C. E. F. Allen* 85, type in Kew Herb.; Victoria Falls, near Cascade Falls, Nov. 1906, a "spreading thorny tree," *C. E. F. Allen* 421 (appears to be this, but the specimen is leafless and otherwise very incomplete). Portuguese East Africa: Tette District, opposite Sena, June, 1859, *Dr. J. Kirk*, in fruit. Gazaland, Boka, Lower Buzi, 400 ft. elev., on limestone, Dec. 20, 1906, *Swynnerton* 1432 (a very incomplete specimen); Madanda Forest, a medium-sized tree, flowering Sept.-Oct. 1911, *Dawe* 462 (inflorescence very floriferous and somewhat fasciated).

Vernacular names (Chitonga): "mWangura" *teste* Stevenson; (Port E. Africa) "chiViri" *teste* Dawe.

Uses. Wood valued for handles for picks, hoes and axes, and for wheel-spokes.

Pterocarpus Stevensonii is an abundant species in the Siburu Forest, in the Upper Zambesi drainage basin, where it is associated with *Baikiaea plurijuga* Harms.

Hippocratea Kennedyi *Hoyle*, sp. nov. [Hippocrateaceae]; affinis *H. Chevalieri* Hutch. et M. B. Moss, sed bracteolis brevioribus integerrimis, petalis majoribus spathulatis, foliis ellipticis tenuiter membranaceis margine haud conspicue serratis, differt.

A glabrous climber with greyish bark; bud-scales persistent at the base of the current year's growth; the slender *branchlets* angular, striate, grooved between the decurrent bases of the *petioles*, which are 5-7 mm. long, slender and deeply channelled above. *Stipules* minute, subulate. *Leaves* opposite, thinly membranous, 9-13 cm. long, 3.5-5 cm. broad, broadly oblanceolate to elliptic or obovate, more or less tapered to the cuneate base, gradually or subabruptly caudate-acuminate, acumen up to 2.5 cm. long, minutely mucronulate; the midrib and the 7-8 pairs of lateral nerves very slender, sub-prominent on both surfaces, with conspicuous delicate reticulation between, the main nerves arcuate-ascending; margin shallowly and unevenly crenate-serrulate except at base and apex, with marginal nerve. *Cymes* axillary and subterminal, pedunculate,

corymbose, dichotomous, 2-3 cm. long and 2 cm. wide, reddish all over, the branchlets short, stout, deeply grooved and verrucose; peduncles 1-2 cm. long, slender; bracteoles paired and more or less connate at the base, spreading, deltoid-acuminate, 0.5-1 mm. long; pedicels rather crowded, slender, about 2 mm. long. *Sepals* 5, almost free, 1 mm. long, orbicular, imbricate, shortly fimbriate on the margin. *Petals* 5, imbricate, coriaceous, cuneate-spatulate, rounded at the apex, 4 mm. long, 2 mm. broad. *Stamens* 5; filaments about 0.75 mm. long, flattened, incurved, arising from the margin of an annular disc which is adnate to the base of the ovary; anthers reniform, 0.5 mm. across, opening by a transverse terminal slit. *Ovary* 3-locular, globose, 1 mm. in diameter, surmounted by 3 sessile oblong stigmas 0.5 mm. long; ovules several in each locule, on axile placentas. *Fruit* not seen.

WEST TROPICAL AFRICA. S. Nigeria: Sapoba, J. D. Kennedy 858, type in Kew Herb.

Hippocratea Vignei Hoyle, sp. nov. [Hippocrateaceae]; affinis *H. guineensi* Hutch. et M. B. Moss, sed petalis intus pilosis, inflorescentia vix ferruginosa, foliis membranaceis latioribus crebre et tenuiter reticulatis, acumine longiore, differt.

A climber glabrous except the inflorescence; *branchlets* slender, terete, flattened at the distant nodes. *Stipules* paired, deltoid acuminate, 1.5 mm. long, coriaceous, subpersistent, leaving a conspicuous interpetiolar scar on falling; petioles 1.2-1.5 cm. long, rather slender, channelled above, drying almost black. *Leaves* opposite, membranous, translucent olive-green, finely reticulate on both surfaces, broadly oblong-elliptic to suborbicular, 8-12 cm. long, 4.5-7 cm. broad; apex abruptly and obtusely acuminate, acumen 1-1.5 cm. long; base cuneate to rounded, but always very shortly tapering at its junction with the petiole; margin cartilaginous, finely and regularly crenate-serrate except at the entire base; upper surface with midrib scarcely impressed and lateral nerves finely channelled; lower surface with the midrib and slender lateral nerves prominent, and tertiary nerves parallel; lateral nerves 7-8 on each side of the midrib, strongly arcuate. *Cymes* axillary and subterminal, laxly branched, 6-12 cm. across, the branches spreading, compound-dichasial, fulvous-tomentellous; peduncles 2-4 cm. long, glabrous, striate; bracts and bracteoles lanceolate, 1-2 mm. long, glabrescent. *Flowers* on tomentellous 3-4 mm. long pedicels, the flower-buds subglobose, 2.5 mm. in diameter just before opening, tomentellous outside. *Calyx* pateriform, 5-dentate, open in bud, 2 mm. in diameter. *Petals* 5, spreading, 3 mm. long, 1-1.5 mm. wide, oblong-elliptic, subacute, coriaceous, tomentose outside, the upper half pilose inside. *Disc* large, fleshy, depressed globose, tomentellous, the margin annular, thick, pubescent. *Stamens* 3, arising inside the margin of the disc on very short flattened filaments 0.5 mm. long; anthers very broadly obovate, 0.5 mm. broad, opening by a transverse terminal slit. *Ovary*

embedded in the centre of the disc, 3-locular with numerous ovules on axile placentas ; style extremely short ; stigma entire or 2-3-fid.

WEST TROPICAL AFRICA. Gold Coast : Kwahu Prahsu, C. Vigne 1752, type in Kew Herb. "Liane, common, to top of trees ; profuse small cream flowers." Fl. June, 1929.

Homalium neurophyllum Hoyle, sp. nov. [Samydaceae] ; affinis *H. dolichophyllo* Gilg ex Hutch. et Dalz., sed calycis tubo brevior, foliis minoribus basim vix cordatis, nervis lateralibus pluribus, ramulis novellis fulvo-tomentellis, differt.

A tree 20 m. high. Young branchlets, inflorescence, petioles and nerves beneath more or less fulvous-tomentellous. *Stipules* large, falcate-reniform, subsistent, up to 1.2 cm. long and 1 cm. broad, glandular-serrate, strongly arcuate-nerved, puberulous. *Leaves* shortly petiolate, 11-18 cm. long, 5.5-9 cm. broad, oblong-elliptic to broadly elliptic or slightly obovate ; apex obtusely cuspidate-acuminate ; base rounded to truncate or subcordate ; margin cartilaginous, bluntly serrate with a circular gland on the lower surface of each tooth ; upper surface glabrous, reticulate, with midrib impressed ; lower surface with midrib and lateral nerves very prominent, and tertiary nerves subparallel, with reticulation between, the midrib and lateral nerves remaining more or less pubescent ; lateral nerves 11-14, conspicuously closer together towards the base of the leaf, spreading obliquely, and strongly arcuate near the apex. *Panicles* axillary and terminal, up to about 25 cm. long and 20 cm. broad, laxly branched, the branches slender and whip-like, subspicate, bearing numerous flowers in fascicles of 2-4 together in the axils of deciduous bracteoles. *Flowers* (fruiting stages) 5-6-merous ; pedicels 0.5-1 mm. long, tomentellous, articulated at the top and often persisting as pegs after the flowers have fallen. *Calyx* short for the genus, subrotate even in fruit, tomentellous, the tube about 0.5 mm. long, the 5-6 narrowly oblong subacute lobes 1.5-2 mm. long and 0.75 mm. broad. *Petals* arising from between the bases of the calyx-lobes, spatulate, pubescent, strongly accrescent in fruit, at length 11-13 mm. long, 3-3.5 mm. broad. *Disc* of separate fleshy, swollen, puberulous, more or less semilunar glands opposite the sepals. *Stamens* equal in number to the petals and opposite to them ; filaments linear, 2 mm. long, slightly pubescent ; anthers subglobose, the rounded cells diverging slightly below, dorsifixed. *Fruiting ovary* adnate at the base to the calyx-tube, the free part conical, 1 mm. long, white-tomentose outside and inside, 1-locular with a (spurious) linear central axis, and 3-6 strap-shaped arching parietal placentas each bearing several pendulous seeds at its apex ; style 1 mm. long, dividing into 3-6 short linear stigmas, the whole fruit splitting readily on dissection into as many portions, each bearing a placenta within.

WEST TROPICAL AFRICA. Gold Coast : Offinso, C. Vigne (Gold Coast Forest Herb. No. 1182), type in Kew Herb. : Aiyem, Upper W.

Reserve, C. Vigne 179. "A tree in closed forest 60 ft. high, 4 ft. girth, very hard wood yellow-white. Alt. 800'." Fl. June, 1928.

Vernacular name : "Asun-Kruma."

Tecleopsis *Hoyle et Leakey*, gen. nov. [Rutaceae]; affinis *Toddaliopsi* Engl., a qua floribus hermaphroditis, ovario 2-, rarissime 3-(4?)-loculari, fructu glanduloso-punctato neque verrucoso, recedit.

Arbores inermes. *Folia* 3-foliolata, pellucido-punctata. *Flores* paniculati, bisexuales. *Calyx* 4-dentatus. *Petala* 4. *Stamina* 8. *Ovarium* 2-, rarissime 3-(4?)-loculare, alte longitudinaliter sulcatum, carpellis conjunctis; ovula pendula in loculo solitaria. *Fructus* 2-, interdum 1-, rarissime 3-carpellatus, glanduloso-punctatus. *Semina* exalbuminosa, pro loculo 1. *Embryo* rectus, radiculo superiore, cotyledonibus carnosus.

Tecleopsis glandulosa *Hoyle et Leakey*, sp. nov.

Arbor mediocris, ramulis novellis fortiter striatis fulvo-tomentosis, glabrescentibus, cortice cinereo vel rubescente. *Folia* opposita, interdum subopposita, petiolo 1.5-4 cm. longo supra canaliculato pubescente vel tomentoso, petiolulis 2-8 mm. longis fortiter canaliculatis primum tomentosis, foliolis 3 laxe sed distincte glanduloso-punctatis utrinque reticulatis usque ad 12 cm. longis et 4 cm. latis oblongo-lanceolatis vel oblanceolatis apice obtuse acuminatis basi acute cuneatis saepe inaequilateralibus margine obscurissime crenulatis supra glabris nitidulis sparse glanduloso-punctatis infra primum (praecipue in costa) pubescentibus tandem glabris sparse et conspicue glanduloso-punctatis. *Paniculae* axillares et terminales, densissime fulvo-tomentosae, usque ad 12 cm. longae et 10 cm. latae, cymulis in ramis distanter dispositis. *Flores* pro cymulo 3-10, pedicellis usque ad 2 mm. longis pubescentibus vel glabris. *Calyx* glaber, alabastro apertus, 1 cm. longus, alte et irregulariter 4-dentatus, dentibus obtusis ciliatis. *Petala* 4, vix imbricata, circiter 2.5 mm. longa, latissime elliptica, conspicue pellucido-punctata, subaequalia, interdum 2 connata vel 1 latius. *Stamina* 8, filamentis linearibus 2.5 mm. longis glabris, antheris versatilibus 0.75 mm. longis, thecis infra divergentibus. *Discus* magnus, carnosus, 1.5 mm. longus et latus, cum ovario densissime pilosus. *Ovarium* parvum, disci in parte superiore dispositum, bicarpellatum, loculis rarissime 3 (vel 4?). *Stylus* vix visus. *Ovula* pro loculo 1, ab apice pendula, succinea. *Fructus* maturus laete ruber, sicco brunneus, glaber, plerumque 2-, interdum abortu 1-, rarissime tamen 3-locularis, circiter 1.5 cm. longus et latus, latissime compresso-ellipticus, fibro-carnosulus, inter carpellas sulcatus, extus conspicue glanduloso-punctatus, pedicello crasso 5 mm. longo. *Semina* pro loculo 1, pendula, usque ad 1.2 cm. longa et 1 cm. lata, ellipsoidea. *Embryo* rectus, radiculo superiore, cotyledonibus plano-convexis carnosus, plumula parva.

EAST TROPICAL AFRICA. Kenya Colony: Kikuyu, Kikueru, H. G. Deakin 323, type in Kew Herb. & Imp. For. Inst. Herb., Oxford.

Vernacular name (Kikuyu, Itu): "Munderendu," used also for *Teclea viridis* Verdoorn, and other allied trees.

The above-mentioned specimen (*H. G. Deakin* 323), comprises leaves and flowers. J. H. Echelez subsequently sent another specimen, no. 503, stating that it was a fruiting specimen of no. 323. The two specimens compare in all points, and the fruit of the type description is that of Echelez 503. The notes given by Echelez are as follows:—"A medium sized forest tree growing in mixed forest of *Juniperus procera*, *Olea Hochstetteri*, *Warburgia ugandensis*, *Calodendrum capense*, etc., at Kikuyu, 7000 ft., rainfall 40 ins. The fruits when ripe are covered with a bright red epicarp. The mesocarp is fleshy, but as the fruit gets older the epicarp turns brown and the mesocarp becomes dry and somewhat spongy. Collected Nov. 1931."

Entandrophragma lucens *Hoyle*, sp. nov. [Meliaceae]; affinis *E. caudato* Sprague, a qua foliis glabris, foliolis longioribus subcoriaceis, capsula angustiore valvis tenuibus extus purpureo-vel atrobrunneis, columna centrali purpureo-brunnea alata vel acutissime angulata, recedit.

A large tree. Leaves up to 40 cm. or more long, paripinnate (?), 6-jugate, glabrous; petiole 9-11 cm. long, like the rhachis and petiolules striate and glaucous; rhachis 15-17 cm. long; petiolules slender, 1.2-3.2 cm. long; leaflets usually alternate, thinly coriaceous, very densely and minutely pellucid-punctate, 6.5-11 cm. long, 3.0-4.2 cm. broad, ovate- to elliptic-oblong, apex abruptly long-acuminate, acumen very acute, gland-tipped, 1.3-2.0 cm. long, base rounded or very broadly cuneate, somewhat unequal-sided, upper surface dark shining green, laxly reticulate, dotted with minute black glandular papillae, the striate midrib slightly impressed; lower surface a lighter dull green, closely reticulate, with midrib prominent; lateral nerves 10-14 pairs, subprominent above, prominent beneath; obliquely ascending and arcuately looped twice or thrice close to the margin. Flowers not seen. Capsule 5-locular, narrowly oblong, cylindrical, 12-15 cm. long, 2.5-3 cm. broad, apex acute or shortly cuspidate, base rounded or obtuse; valves linear-oblong, 12-15 cm. long, 1.7-2.0 cm. broad, dehiscing elastically from the base and shortly cohering at the apex for some time, the margin irregularly broken; apex acute; base obtusely cuneate or truncate; outer surface purplish-brown or almost black, rugosely striate, sparsely and inconspicuously lenticellate; inner surface smooth and shining, yellowish-brown, delicately variegated with brown or dark brown markings, the impression of the seeds more or less visible; central column strictly pentagonal in the lower third, the septa conspicuously wing-like in the upper two-thirds, the faces between the septa dark purplish-brown, showing the very distinct oval impressions of the seeds, the topmost seed arising about 5 mm. from the winged apex of the column. Seeds 5-6 per loculus, 1.2-1.8 cm. long, 1-1.5 cm. broad, with a distal oblong obtuse wing 3.5-7.5 cm. long, 1.5-1.8 cm.



Entandrophragma lucens Hoyle. Fig. 1, leaf. 2, portion of leaflet showing venation. 3, fruit showing dehiscence. 4, valve of fruit (inner face). 5, same (outer face). 6, seed (inner face). 7, same (outer face)—all $\times \frac{3}{8}$.

broad directed towards the base of the capsule ; seeds convex on the inner face, concave or plane on the outer, truncate or emarginate at the attached end, which bears a small elliptic hilum only 4 mm. long, attached slightly to right and left of the centre of each face of the central column to a prominent horn at the upper end of each oval depression, the horn continued upwards through the next depression in the form of a wing-like ridge ; the seeds often remain attached to the horns by small elastic masses of microscopic spirally thickened threads resembling cotton-wool ; fruit-stalk short and stout, 5-6 mm. long and broad.

EAST TROPICAL AFRICA. Tanganyika Territory : near Muzi, 1 $\frac{1}{4}$ hrs. from Kasanga on Kasoti path, collected by the late *Mr. C. Grey*, No. 5, type in Kew Herb. Communicated to the Imperial Forestry Institute by the Forest Products Research Laboratories, Princes Risborough.

"Straight clean trunk. Alt. above lake about 800 ft. Only tree in this locality."

Vernacular name : (Msofwe) " mTembo."

***Chrysophyllum edule* Hoyle**, sp. nov. [Sapotaceae] ; affinis *C. albido* G. Don, sed foliis vix acutis, ramulis novellis, floribus, et foliis infra ferrugineo-tomentellis, costa et nervis lateralibus infra prominentioribus, corollae lobis densissime ciliatis, recedit.

A tree. Young branchlets angular, strongly ribbed, densely appressed ferruginous-tomentellous, becoming glabrous and terete with grey bark ; leaf-scars prominent, decurrent. Leaves when mature 13-25 cm. long, 6-9 cm. broad, coriaceous, oblong- to narrowly obovate-elliptic ; apex obtuse or subacute ; base cuneate ; margin entire, slightly revolute ; upper surface glabrous, dull green, very closely areolate, with midrib and lateral nerves impressed ; lower surface densely ferruginous-tomentellous, with midrib and lateral nerves prominent ; lateral nerves 13-18 pairs, obliquely ascending, arcuately looped close to the margin ; tertiary nerves parallel, not prominent ; petiole 1.7-3 cm. long, strongly ribbed, ferruginous-tomentellous. Flowers unisexual (?) in axillary fascicles forming distinct warts on the current year's wood ; pedicels 1-2.5 mm. long, ferruginous-tomentellous. Calyx 2.5-3 mm. long and broad, divided almost to the base into 5 ovate obtuse sepals, densely ferruginous without, pilose within. Corolla-tube puberulous within the staminodes above or glabrous, 1-1.5 mm. long, the 5 lobes about the same length, glabrous except for the densely ciliate margins. Staminalodes 0.5 mm. long, lanceolate, acute, sessile, their filaments entirely adnate to the base of the corolla-tube, opposite the lobes. Ovary sessile, ovoid, 1.5 mm. long, densely pilose-tomentose, 5-locular ; ovules solitary ; style columnar 1.5 mm. long, glabrous ; stigma subtruncate, obscurely 5-lobed. Fruit (immature) ovoid, fleshy, drying hard, 3.5 cm. long, 3 cm. broad, longitudinally ridged, densely ferruginous, glabrescent. Seeds 3-5, about 2.2 cm. long, and 1.2 cm. broad, shining nut-brown.

WEST TROPICAL AFRICA. S. Nigeria : Sapoba, *J. D. Kennedy* 1613, type in Kew Herb.

Vernacular name (Benin) : " Omumu."

This species approaches in general appearance most nearly to *C. albidum* G. Don, although it is also closely allied to *C. africanum* A. DC. It differs from both in the comparatively obtuse leaves, and from *C. africanum* in having a much smaller fruit and narrower, more coriaceous leaves with fewer nerves. From *C. albidum* it differs in having the lobes of the corolla densely, instead of only slightly, ciliate, and the young branchlets, leaves and flowers much more definitely and coarsely ferruginous, in which last respect it is nearer *C. africanum*.

The native name of the species indicates the sensation experienced by a Beni native on masticating the fruit, of which he is said to be extremely fond. The tree is grown in villages for food, and is distinguished there from *C. albidum*.

It is understood that the name OMUMU or a similar word is used by natives for other genera.

Strychnos reticulata *Burtt Davy et Honoré*, sp. nov. [Loganiaceae] ; affinis *S. usambarensi* Gilg, a qua foliis supra distincte et prominente reticulatis apice vix apiculatis, pedunculis ramulisque cymorum longioribus et crassioribus, cymis densioribus, floribus majoribus, recedit.

A small tree, glabrous except the inflorescence. *Branchlets* greenish, angular, deeply channelled, becoming terete, with yellowish or grey bark. *Stipules* absent or very early caducous. *Leaves* opposite, subsessile, broadly ovate to elliptic, or even lanceolate, 2-5 cm. long, up to 3 cm. broad, strongly reticulate on both surfaces, shining above, apex rounded to subacute or minutely apiculate, base rounded to subcordate, more rarely cuneate, margin entire, basal nerves 5, prominent above. *Cymes* axillary, dense, up to about 2 cm. long, usually 20-30 flowered, more or less pubescent ; peduncles 0.5-1 cm. long, bracts lanceolate from a broad base, 2 mm. long, bracteoles small, ovate, ciliolate, pedicels very short. *Sepals* 5, imbricate, orbicular, puberulous and ciliolate, 1 mm. in diameter, green. *Petals* 5, almost free, ovate, subacute, 2.5-3 mm. long, coriaceous, green, glabrous. *Anthers* half as large as the petals, sessile. *Ovary* superior. *Disc* fleshy, glabrous. *Fruit* not seen.

EAST TROPICAL AFRICA. Kenya Colony : growing at an altitude of 5000-6000 ft., *Conservator of Forests*, No. 40, type in Kew Herb. and Imp. For. Inst. Herb., Oxford.

Vernacular name : " muTete."

XXXV.—RESEARCHES ON *SILENE MARITIMA* AND *S. VULGARIS*: IX.*—E. M. MARSDEN-JONES AND W. B. TURRILL.

A STATISTICAL STUDY OF CHARACTERS IN A WILD POPULATION OF *S. VULGARIS*.

The population of *Silene vulgaris*, of which two samples, each of one hundred specimens, are analysed below, occurred around The Ridgeway, $1\frac{1}{2}$ miles almost due north of Compton, Berkshire, 120–146 m. altitude (Ord. Survey, Reading District sheet). The area consists of chalk downland. The samples were taken from the grassy sides, six yards wide, of an old farm road running across the Down. On the west of the road there was an enclosed grazed pasture and on the east open arable land. The *Silene* population was a considerable one and the conspicuous associated species were: *Carduus nutans* L., *Reseda lutea* L., *Potentilla Anserina* L., *Daucus Carota* L., *Sinapis arvensis* L., *Lychnis alba* Mill., *Trifolium medium* (L.) Huds., *Ononis spinosa* L., *Peucedanum sativum* (L.) Benth. et Hook. fil., *Achillea Millefolium* L., *Cirsium arvense* (L.) Scop., *Matricaria inodora* L., *Galium verum* L., *Spiraea Filipendula* L., *Plantago major* L., *P. lanceolata* L., *P. media* L., *Lotus corniculatus* L., *Poterium Sanguisorba* L., *Leontodon autumnalis* L., *Linaria vulgaris* L., *Lithospermum arvense* L., *Dactylis glomerata* L., *Lolium multiflorum* Lam., and *Poa trivialis* L. var. *glabra* Doell.

The first sample of 100 specimens in flower was collected, on 1st July, 1931, at random and analysed for the characters with which we are dealing in this series of papers, except for fruits and seeds. The scorings for fruit and seed characters were made from a second random sample taken from another 100 plants of the same population on 19th August 1931. The results of analysis, including quantitative and qualitative variates, are given below under the headings of organs and characters.

Height of flowering stems. The highest stem per plant, including inflorescence, measured to nearest cm.

Maximum 10 dm. Minimum 4.1 dm. Mean 6.46 dm.
Standard deviation 1.044.

Number of internodes. Counts were made of the number of internodes above ground level up to but not including the inflorescence.

Maximum 15. Minimum 6. Mean 9.68.
Standard deviation 1.865.

Length of middle internode. The middle internode was determined arithmetically, with an even number the one immediately above the middle node being measured.

Maximum 8 cm. Minimum 1.5 cm. Mean 5.05 cm.
Standard deviation 0.8.

Length of longest internode. This was invariably that immediately below the inflorescence.

*Continued from *K.B.* 1932, 241.

Maximum 24 cm. Minimum 5 cm. Mean 15.83 cm.
Standard deviation 4.2.

Habit. Strict plants 27 : not strict plants 73.

Anthocyanin in vegetative parts. Much 0 : some 96 : none 4.

Indumentum. Dense 3 : medium 14 : few hairs 12 : glabrous 71.

Leaves. For measurements well developed leaves were chosen, not unduly enlarged ones. In the following summary the figures are given for the whole population and for the strict and not strict plants separated.

	Maximum.	Minimum.	Mean.	Standard deviation.
Length, whole sample ...	7.1 cm.	2.8 cm.	5.05 cm.	0.8536
Breadth, whole sample ...	3.0 cm.	0.7 cm.	1.445 cm.	0.3433
Length, strict plants ...	6.3 cm.	3.9 cm.	5.06 cm.	0.6821
Breadth, strict plants ...	2.1 cm.	0.7 cm.	1.27 cm.	0.2951
Length, not strict plants ...	7.1 cm.	2.8 cm.	5.04 cm.	0.9190
Breadth, not strict plants ...	3.0 cm.	0.8 cm.	1.5 cm.	0.3427

Correlation between length and breadth

for whole population 0.4620.

for strict plants 0.32 (not of statistical significance).

for not strict plants 0.53.

The not strict plants are more variable in length and breadth than the strict, but length and breadth are more highly correlated in them. The mean length in the two classes is about the same but on the average the not strict have broader leaves.

Measurements of leaves on flowering stems. Four plants with a total of fifteen stems were chosen at random except that they bore fully developed inflorescences whose flowers were at mid-anthesis. The length and breadth of all the green foliage leaves were measured. In the table below the measurements are given in centimeters, one leaf having been measured from each node. Usually the leaves at a node are equal in size, or at least show no great differences in length and breadth. The nodes are numbered from above downwards, node 1 being that immediately below the inflorescence node whose branches are subtended by a pair of bracts.

The tables show that in general there is an increase in length and breadth from above downwards to a maximum for each stem, after which a slight decrease is usual. Occasionally a relatively smaller pair of leaves may occur about the middle node and break the regularity of the sequence. New shoots of *S. vulgaris* normally commence growth in early spring. It may be suggested that the first formed (lowest) leaves largely utilize stored food material and that it is not till about half the nodes have developed leaves that the foliage is fully functioning in food manufacture and the soil has attained a favourable temperature for root absorption. It should be noted that in flowering stems there are usually several of the lowest nodes with only brown and shrivelled leaves or their remains.

These are not included in the table but it appears that in general they are smaller than the leaves of the nodes above them. The maximum of foliage size is reached when the stem concentrates its use of food in developing the inflorescence, especially the flowers, with consequent reduction in leaf size and the final production of bracts.

Plant No. 2, of not strict habit.

<i>Stem I.</i>		<i>Stem II.</i>	
Node 1.	4.0×1.2	Node 1.	4.0×1.2
" 2.	4.5×1.3	" 2.	4.0×1.1
" 3.	4.5×1.3	" 3.	3.7×1.1
" 4.	4.1×1.2	" 4.	3.7×1.0
" 5.	3.2×0.8	" 5.	3.3×1.0
		" 6.	3.2×0.9
Mean	4.06×1.16	Mean	3.65×1.05
<i>Stem III.</i>		<i>Stem IV.</i>	
Node 1.	2.9×0.8	Node 1.	3.7×1.0
" 2.	4.0×0.9	" 2.	4.7×1.4
" 3.	4.0×1.0	" 3.	4.7×1.2
" 4.	4.0×1.2	" 4.	4.7×1.3
" 5.	3.5×1.0	" 5.	3.7×1.1
" 6.	3.1×0.6	" 6.	4.0×1.1
		" 7.	3.5×1.0
Mean	3.58×0.92	Mean	4.14×1.16
		<i>Stem V.</i>	
Node 1.	3.8×1.1	Node 1.	3.8×1.1
" 2.	4.5×1.2	" 2.	4.5×1.2
" 3.	4.7×1.3	" 3.	4.7×1.3
" 4.	4.5×1.0	" 4.	4.5×1.0
" 5.	3.3×1.0	" 5.	3.3×1.0
" 6.	3.3×0.8	" 6.	3.3×0.8
Mean	4.02×1.07		

Plant No. 24, of strict habit.

<i>Stem I.</i>		<i>Stem II.</i>	
Node 1.	3.0×0.9	Node 1.	3.4×1.2
" 2.	3.3×1.2	" 2.	3.0×1.0
" 3.	3.6×1.2	" 3.	3.0×1.4
" 4.	3.7×1.6	" 4.	2.0×1.0
" 5.	3.7×1.3	" 5.	3.2×0.9
" 6.	4.0×1.1	" 6.	3.6×1.2
" 7.	4.6×1.2	" 7.	3.6×0.8
" 8.	3.1×0.9	" 8.	3.2×0.9
Mean	3.63×1.18	Mean	3.13×1.05
<i>Stem III.</i>		<i>Stem IV.</i>	
Node 1.	3.2×1.2	Node 1.	2.7×1.0
" 2.	3.3×1.2	" 2.	3.0×1.0
" 3.	3.6×1.6	" 3.	3.0×0.8
" 4.	3.5×1.3	" 4.	2.9×1.2
" 5.	3.7×1.3	" 5.	2.1×0.6
" 6.	3.5×1.1	" 6.	2.3×1.0
" 7.	3.2×0.7	" 7.	2.7×0.9
" 8.	3.1×0.9	" 8.	3.0×0.9
Mean	3.39×1.16	" 9.	2.3×0.8
		<i>Stem V.</i>	
Node 1.	2.0×0.8	Node 1.	2.0×0.8
" 2.	2.4×0.8	" 2.	2.4×0.8
" 3.	2.6×1.1	" 3.	2.6×1.1
" 4.	2.6×1.2	" 4.	2.6×1.2
" 5.	2.9×1.0	" 5.	2.9×1.0
" 6.	2.9×1.0	" 6.	2.9×1.0
" 7.	2.5×0.9	" 7.	2.5×0.9
" 8.	2.8×1.0	" 8.	2.8×1.0
Mean	2.59×0.98		
Mean	2.67×0.91		

Plant No. 26, of strict habit.

<i>Stem I.</i>		<i>Stem II.</i>	
Node 1.	3.8×1.6	Node 1.	3.0×0.9
" 2.	4.5×1.7	" 2.	4.4×1.5
" 3.	5.0×1.8	" 3.	4.5×1.5
" 4.	5.3×1.8	" 4.	4.7×1.4
" 5.	5.0×1.3	" 5.	4.9×1.6
" 6.	5.7×1.2	" 6.	5.0×1.7
" 7.	6.2×1.8	" 7.	5.8×1.7
" 8.	5.3×1.6	" 8.	5.6×1.3
Mean	4.98×1.60	Mean	4.74×1.45

Plant No. 40, of strict habit.

<i>Stem I.</i>		<i>Stem II.</i>		<i>Stem III.</i>	
Node 1.	2.4 × 0.6	Node 1.	3.5 × 1.2	Node 1.	3.0 × 0.8
„ 2.	3.0 × 1.0	„ 2.	4.5 × 1.8	„ 2.	3.8 × 1.3
„ 3.	3.8 × 1.1	„ 3.	4.7 × 1.7	„ 3.	4.0 × 1.7
„ 4.	3.9 × 1.4	„ 4.	5.3 × 2.1	„ 4.	4.4 × 1.7
„ 5.	3.8 × 1.4	„ 5.	4.8 × 1.6	„ 5.	4.0 × 1.5
„ 6.	3.5 × 1.1	„ 6.	5.9 × 2.2	„ 6.	4.0 × 1.2
„ 7.	3.8 × 0.7	„ 7.	6.0 × 2.2	Mean	3.87 × 1.35
Mean	3.46 × 1.04	„ 8.	5.7 × 1.6		
		Mean	5.05 × 1.80.		

For all the green foliage leaves at anthesis (4 plants, 15 flowering stems, 108 leaf-pairs) the following values have been obtained :

Average number of pairs of green leaves per flowering stem : 7.2.

Maximum length : 6.2 cm.

Minimum length : 2.0 cm.

Grand mean length : 3.8 cm.

Maximum breadth : 2.2 cm.

Minimum breadth : 0.6 cm.

Grand mean breadth : 1.2 cm.

Number of flowers. In each plant the flowers were counted in the inflorescence with the largest number.

Maximum 61. Minimum 10. Mean 29.63.

Standard deviation 10.

Calyx. Inflated 42. Subinflated 44. Narrow 14. Much anthocyanin 0. Some anthocyanin 100. No anthocyanin 0.

Corolla.

Length of petals. Claw and lamina included.

Maximum 1.9 cm. Minimum 1.1 cm. Mean 1.497 cm.

Standard deviation 0.0164.

Breadth of petals. Lamina.

Maximum 9 mm. Minimum 4 mm. Mean 5.95 mm.

Standard deviation 0.12.

Correlation between length and breadth of petals 0.42.

Lobing of petals. $\frac{3}{4}$ lobing 99. $\frac{2}{3}$ lobing 1.

Overlapping. Petals overlapping 0. Petals not overlapping 100. Segments overlapping 0. Segments not overlapping 100.

Anthocyanin. Blotch present 4. Blotch not present 96.

Corona. Boss 86. Small scale 14.

Sex. Hermaphrodite 32. Female 68.

Androecium. In the 32 hermaphrodite plants.

Filaments pink 28, i.e. 87.5% of the hermaphrodite plants.

„ white 4, i.e. 12.5% „ „ „

Anthers purple 32, i.e. 100% „ „ „

Anthers yellow-green, 0, i.e. 0% „ „ „

Gynaeceum. For all plants.

Stigmata pink 73. Stigmata white 27.

Immature seeds pink 10. Immature seeds white 86.

Immature seeds not scorable 4.

Fruits. Type I. 38. Type II. 25. Intermediate (I.-II.) 37.
Mature Seeds. Armadillo 2. Weak armadillo 8. Tubercled 78.
Strongly tubercled 12.

Summary and Conclusions.

1. A statistical analysis is given of samples of a population of *Silene vulgaris* growing near Compton, Berkshire. The full significance of this analysis will not be apparent till after the publication of comparable analyses of coastal (*S. maritima*) and high mountain populations.

2. The characters studied may be classified as follows :

A. *Involving measurements.*

Heights of flowering stems.

Lengths of middle and longest (highest) internodes.

Lengths and breadths of leaves.

Lengths and breadths of petals.

B. *Involving counts.*

Numbers of internodes.

Numbers of flowers.

C. *Qualitative scoring.*

Habit.

Anthocyanin in vegetative parts.

Indumentum.

Calyx shape and anthocyanin.

Lobing, overlapping, and anthocyanin of petals.

Corona.

Sex.

Anthocyanin in filaments, anthers, stigmata, and immature seeds.

Fruit shape.

Testa markings.

3. Attention is called to the following :

i. The longest internode is invariably that immediately below the inflorescence.

ii. The rather high number of strict plants (27%).

iii. The absence of plants with much anthocyanin in their vegetative parts.

iv. The few plants (3%) with dense indumentum.

v. The leaf measurements, showing means, for well developed leaves, of 5.05 cm. length and 1.445 cm. breadth, and usually an increase in length and breadth from above downwards, with a final slight decrease.

vi. The mean flower number per inflorescence 29.6.

vii. The mean petal length of 1.49 cm. and breadth 5.95 mm.

viii. $\frac{2}{3}$ petal lobing in only 1%, anthocyanin blotch in only 4%, small scale in 14%.

ix. The complete absence of overlapping of both petals and segments.

- x. The unusually high number of female plants (68%).
- xi. The absence of yellow-green anthers.
- xii. The number of immature pink seeds (10%).
- xiii. The low number of full armadillo seeds (2%).

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XXXVI.—CONTRIBUTIONS TO THE FLORA OF SIAM.* ADDITAMENTUM XXXIV.

Urophyllum oblongum Craib, Fl. Siam. Enum. ii. 84 (1932), descr. ampl. [Rubiaceae-Mussaendeae]; ab affini *U. Griffithiano* (Wight) foliis subtus in nervorum axillis pilosis, stipulis angustioribus, et pedunculo brevi recedens.

Arbuscula circa 5 m. alta (ex Kerr); ramuli iuventute praecipue nodos versus pilis adpressis sparse instructi, cito glabri, sicco primo compressi et sulcati, mox teretes, stramineo-virides, pallide virides. vel olivacei, lenticellis parvis nec numerosis nec conspicuis. *Folia* opposita, saepissime lanceolato-oblonga, apice obtuse acuminata vel subcaudato-acuminata, basi saepe parum inaequilateralia, cuneata vel late cuneata, 13–24 cm. longa, 4–7·8 cm. lata, rigide chartacea, sicco subviridia, subtus parum pallidiora, supra glabra, subtus ad costam nervosque laterales pilis paucis instructa, cito glabrescentia, praetereaque in nervorum axillis plus minusve pilosa, costa supra impressa subtus prominente, nervis lateralibus utrinque 9–10 supra plus minusve conspicuis subtus prominentibus, nervulis subtus subprominulis, petiolo 1–1·5 cm. longo supra canaliculato suffulta; stipulae deciduae, ad 1·5 cm. longae et basi 3 mm. latae, dorso pilis adpressis tectae. *Cymae* axillares, condensae, et pedunculo communi brevi et floribus inclusis petiolo dimidio breviores; pedunculus communis adpresse hirsutus; pedicelli ad 4 mm. longi, pilis brevibus albis adpressis instructi. *Receptaculum* pilis brevibus albis sparse instructum. *Calyx* fl. masc. circa 1·5 mm. longus, apice vix denticulatus, dorso subglaber. *Corollae* dorso glabrae tubus 2 mm. longus, intra apice annulo denso pilorum erectorum instructus, lobi 5, crassi, subelliptici, apice subacuti, 3 mm. longi, 2 mm. lati, glabri. *Filamenta* 0·5 mm. longa, ad corollae tubi apicem inserta; antherae apiculatae, 1·5 mm. longae.

Takuapa, Kapong, 100 m., evergreen forest, Kerr 17, 131.

Tarenna cinerea Craib, Fl. Siam. Enum. ii. 88 (1932), descr. ampl. [Rubiaceae-Gardenieae]; inter species calycis segmentis latis et corolla extra haud glabra ob indumentum densum persistentem foliorum paginae inferioris *T. pubescenti* Craib tantum affinis a qua indumento tenuiore adpresso et calycis segmentis conspicue brevioribus distincta.

* Continued from *K.B.* 1932, 149.

Arbor circa 5 m. alta (ex *Kerr*) ; ramuli iuventute compressi, parce adpresse breviter pubescentes, mox glabri, teretes, cortice brunneo vel cinereo-brunneo obtecti, lenticellis haud conspicuis. *Folia* oblongo-oblancoolata, elliptico-oblancoolata, vel rarissime elliptico-obovata, apice acuminata vel subacuminata, basi cuneata, 6–10 cm. longa, 2·5–4 cm. lata, coriaceo-chartacea, supra glabra, subtus dense adpresse molliter cinereo-pubescentia, costa supra impressa subtus prominente, nervis lateralibus utrinque 10–12 supra subconspicuis subtus prominentibus, nervulis obscuris, margine recurva, petiolo 5–10 mm. longo suffulta ; stipulae subulato-acuminatae, ad 6 mm. longae, dorso breviter adpresse pubescentes, diu persistentes. *Inflorescentia* terminalis, pedunculo communi circa 1 cm. longo incluso 3 cm. longa, 2 cm. lata, et rhachi et ramulis dense breviter adpresse cinereo-pubescentibus ; bractae angustatae, ad 4 mm. longae ; pedicelli breves vel deficientes. *Receptaculum* 1·25 mm. longum, indumento ei inflorescentiae ramulorum simili tectum. *Calycis* tubus brevis, lobi oblatis, 0·5 mm. longi, paululo ultra 1 mm. lati, ciliati, recurvi. *Corollae* tubus 3 mm. longus, extra glaber, intra superne dense villosus, lobi 5 mm. longi, 2 mm. lati, extra apice parce adpresse pubescentes, intra basi villosi. *Antherae* 4 mm. longae, filamentis brevibus. *Stylus* glaber, cum stigmatibus 1 cm. longus ; ovula loculo quoque solitaria.

Surat, Nawng Wai, 200 m., evergreen on rocky limestone hill, *Kerr* 12,283.

Tarenna cinnamomea *Craib*, Fl. Siam. Enum. ii. 88 (1932), descr. ampl. [Rubiaceae-Gardenieae] ; *T. odoratae* (Hook. f.) habitu subsimilis sed foliis tenuioribus, inflorescentia laxiore indumento sparsiore instructa recedens.

Frutex circa 2·5 m. altus (ex *Kerr*) ; ramuli subgraciles, glabri, cortice cinnamomeo obtecti, lenticellis parvis inconspicuis. *Folia* oblongo-elliptica, oblongo-lanceolata, vel oblongo-oblancoolata, apice acuminata, basi cuneata vel attenuato-cuneata, 9–20 cm. longa, 3–7·5 cm. lata, chartacea, sicco viridia vel hic et illic fusca, pagina utraque glabra, costa supra impressa subtus prominente, nervis lateralibus utrinque 10–15 supra conspicuis subtus prominentibus intra marginem anastomosantibus, nervulis paucis subtus conspicuis, petiolo ad 1·8 cm. longo glabro supra canaliculato suffulta ; stipulae vix 5 mm. longae, glabrae, deciduae. *Inflorescentia* terminalis, recta vel subrecta, pedunculo communi ad 3 cm. longo incluso ad 14 cm. longa, usque ad 12 cm. lata, ramis utrinque saepissime 3, supremis brevibus, partibus omnibus, corolla inclusa, breviter pallide plus minusve adpresse pubescens ; bractae lanceolatae, ad 3 mm. longae ; pedicelli ad 1 cm. longi, infra medium bibracteolati. *Receptaculum* 1·25 mm. longum. *Calycis* tubus 1 mm. longus, lobi deltoidei, tubo paululo breviores, basi 1 mm. lati, ciliati. *Corollae* albae (ex *Kerr*) tubus ante anthesin 6 mm. longus, intra superne dense pilosus, lobi 5, circa 8·5 mm. longi et 3 mm. lati, supra basi pilosi. *Antherae* apiculatae, 7 mm. longae, filamentis brevibus.

Stylus superne brevius pilosus, cum stigmatibus 13 mm. longus, ovulis loculo quoque solitariis placentis immersis.

Chumpawn, Ta Ngaw, 50 m., evergreen forest, *Kerr* 11,468.

Tarennia elliptica *Craib*, Fl. Siam. Enum. ii. 90 (1932), descr. ampl. [Rubiaceae-Gardenieae]; a *T. depauperata* Hutchinson calyce glabro distinguenda.

Arbuscula circa 4.5 m. alta (ex *Garrett*); ramuli glabri, primo fusci, dein brunnei, mox cinerei, lenticellis inconspicuis. *Folia* elliptica, elliptico-obovata, vel obovata, apice brevius acuminata vel cuspidato-acuminata, basi cuneata vel rotundata, 5.5–12 cm. longa, 3–5.7 cm. lata, rigide chartacea, sicco viridia, pagina superiore glabra, inferiore in nervorum axillis subsparse pilosa, aliter glabra, costa supra impressa subtus prominente, nervis lateralibus utrinque 7–10 supra conspicuis vel subprominulis subtus prominulis, nervulis obscuris, petiolo 5–12 mm. longo glabro supra canaliculato suffulta; stipulae circa 6 mm. longae. *Inflorescentia* terminalis, e basi furcata, ad 3 cm. longa et 4.5 cm. lata, glabra; bractee ad 2 mm. longae; flores sessiles vel pedicello ad 2 mm. longo suffulti, pallide aurantiaci, fere albi (ex *Garrett*). *Receptaculum* glabrum, circa 1 mm. longum. *Calycis* tubus brevis, segmenta sicco viridia, apice brevius acuminata vel rotundata, 1 mm. longa, 1 mm. lata, pauperius brevissime ciliolata. *Corolla* extra glabra, tubo vix 4 mm. longo intra apice dense piloso, lobis 5 oblongis apice rotundatis 6 mm. longis 2.5 mm. latis supra inferne pilosis. *Antherae* 5 mm. longae, apiculatae, filamentis glabris ad corollae tubi apicem positis circa 1.5 mm. longis suffultae. *Stylus* apicem versus sparse puberulus vel subglaber, cum stigmatibus 9 mm. longus; ovula loculo quoque solitaria.

Chiengrai, Doi Tam Tu Pu, 530 m., *Garrett* 276.

Tarennia hirsuta *Craib*, Fl. Siam. Enum. ii. 91 (1932), descr. ampl. [Rubiaceae-Gardenieae]; a *T. pulchra* Ridl. corolla extra haud glabra, a *T. sumatrana* (Boerl.) cui habitu similis foliorum nervis lateralibus paucioribus recedit.

Frutex circa 3 m. altus (ex *Kerr*); ramuli primo densius adpresse albo-hirsuti, glabrescentes, cortice brunneo vel pallide brunneo obtecti, lenticellis inconspicuis. *Folia* saepissime elliptica, apice obtuse acuminata vel subacuminata, basi cuneata vel rotundata, 8–16 cm. longa, 3–6.3 cm. lata, rigide chartacea, supra glabra, subtus praesertim ad nervos breviter albo-hirsuta, costa supra conspicua subtus prominente, nervis lateralibus utrinque 7–9 supra conspicuis subtus prominentibus, nervulis paucis subtus conspicuis, petiolo ad 1 cm. longo adpresse hirsuto supra canaliculato suffulta; stipulae 5 mm. longae, dorso adpresse hirsutae, deciduae. *Inflorescentia* terminalis, reflexa vel saepe refracta, pedunculo communi ad 1.5 cm. longo incluso ad 8 cm. longa, circa 10 cm. lata, ramis utrinque 3–4, partibus omnibus, alabastris inclusis, breviter adpresse vel subadpresse albo-hirsuta; bractee angustae, circa

4 mm. longae ; pedicelli ad 6 mm. longi, bracteolis duabus alternis saepissime fere ad medium sed nunquam apice vel sub apicem instructi ; flores albi (ex *Kerr*). *Receptaculum* 1.5 mm. longum, apice constrictum. *Calycis* tubus vix 0.5 mm. longus, lobi 5, deltoidei, ad 0.75 mm. longi, basi ad 1 mm. lati, ciliati. *Corollae* tubus 8 mm. longus, intra superne piloso-pubescent, lobi 5, circa 6 mm. longi et 2.75 mm. lati, ciliati, intra inferne pilis paucis sub-rigidis albis instructi. *Antherae* apiculatae, 6 mm. longae. *Stylus* superne pubescens, cum stigmatibus 1.7 cm. longus, ovulis loculo quoque solitariis in placentis immersis.

Pattani, Kao Kalakiri, 900 m., evergreen forest, *Kerr* 14,976.

***Tarenna hispidula* Craib**, Fl. Siam. Enum. ii. 91 (1932), descr. ampl. [Rubiaceae-Gardenieae] ; a *T. longifolia* (G. Don) foliis subtus ad costam nervosque et aliter iuventute pilis adpressis sat rigidis instructis haud hirsutis recedens.

Ramuli iuventute hirsuti, fusci, compressi, mox glabrescentes, teretes, pallescentes. *Folia* oblongo-oblanceolata, apice acute acuminata, basem versus attenuata, 15–26 cm. longa, 5–7.5 cm. lata, sicca fuscescentia, supra glabra, subtus ad costam nervosque laterales pilis adpressis sat rigidis subsparse instructa et aliter iuventute similiter induta, costa supra conspicua subtus prominente, nervis lateralibus utrinque 13–15 supra conspicuis subtus prominulis intra marginem arcuatim iunctis, nervulis subtus conspicuis vel fere subprominulis, petiolo usque ad 1.8 cm. longo suffulta ; stipulae ad 8 mm. longae, apice subulato-acuminatae, dorso medio adpresse hirsutae. *Inflorescentia* terminalis, pedunculo communi saltem primo nutante ad 11 cm. longo brunneo-hirsuto suffulta, apice trifurca, pedunculis partialibus 2–3 cm. longis, apice trifurcis, pedunculis ultimis brevibus, bracteis primariis 1 cm. longis, pedicellis brevibus vel ad 3 mm. longis basi parvi-bracteatis. *Receptaculum* ad 1 mm. longum, hirsutum. *Calycis* tubus brevis, segmenta 1 mm. longa, hirsuta. *Corolla* extra brunneo-hirsuta, tubo ante anthesin 8 mm. longo, lobis 6 mm. longis. *Antherae* 5 mm. longae, filamentis brevibus. *Stylus* sparse hirsutus.

Langkawi, Burau, *Ridley* 15,818 (Herb. Kew ! et Singapore !).

***Tarenna puberula* Craib**, Fl. Siam. Enum. ii. 94 (1932), descr. ampl. [Rubiaceae-Gardenieae] ; a *T. insulare* Ridl. foliis subtus ad nervos puberulis, corollae alabastro extra densius puberulo recedens.

Frutex circa 1.5 m. altus (ex *Kerr*) ; ramuli primo puberuli, glabrescentes, cortice brunneo-cinereo obtecti. *Folia* oblongo-elliptica, oblongo-oblanceolata, vel subelliptica, apice acute acuminata, basi cuneata vel acuminata, haud rarius inaequilateralis, 7.5–14 cm. longa, 2.5–4.7 cm. lata, sicco fuscescentia vel viridia, chartacea, supra glabra, subtus ad nervos puberula et in nervorum axillis pilosa, costa supra parum impressa subtus prominente, nervis lateralibus utrinque 7–8 supra plus minusve conspicuis subtus pallidis prominentibus, nervulis vix conspicuis, petiolo 3–10 mm.

longo supra parum canaliculato suffulta ; stipulae 6 mm. longae, diutius persistentes. *Inflorescentia* terminalis, corymbiformis, pedunculo communi ad 7 mm. longo incluso ad 3.5 cm. longa, 4 cm. lata, partibus omnibus puberula ; bracteae ad 4 mm. longae ; pedicelli ad 2.5 mm. longi, lateralibus apice bibracteolatis ; alabastra puberula, apice angustata, summo apice stellulata ; flores virides (ex *Kerr*). *Receptaculum* puberulum, 1 mm. longum. *Calycis* tubus brevis, segmenta 5, lineari-lanceolata, acuta, 3 mm. longa, basi 0.75 mm. lata. *Corollae* tubus 5 mm. longus, lobi 7 mm. longi, 2 mm. lati, acute attenuati, basi cum tubi apice pilosi. *Antherae* 4.5 mm. longae, filamentis brevibus. *Stylus* basi excepta pubescens, cum stigmatibus 11 cm. longus, ovulis loculo quoque 3.

Surat, Yanyao, 50 m., light evergreen forest, *Kerr* 18,242.

Tarenna pubescens *Craib*, Fl. Siam. Enum. ii. 94 (1932), descr. ampl. [Rubiaceae-Gardenieae] ; a *T. cinerea* *Craib* foliorum et inflorescentiae indumento longiore facile distinguenda.

Arbor parva, circa 5 m. alta (ex *Kerr*) ; ramuli primo fusci, compressi, longius puberuli, mox brunnei vel cinereo-brunnei, glabri, lenticellis haud conspicuis. *Folia* saepissime lanceolato-elliptica vel elliptica, apice acuminata vel subacuminata, basi cuneata, 7-13 cm. longa, 2-5.3 cm. lata, subcoriacea, sicca supra subviridia, subtus cinerea, supra glabra, subtus molliter pubescentia, pilis ad costam nervosque laterales divergentibus, costa supra saepissime immersa subtus prominente, nervis lateralibus utrinque 10 supra conspicuis subtus prominentibus, nervulis vix conspicuis, petiolo 5-15 mm. longo indumento ei cauli simili tecto supra canaliculato suffulta ; stipulae cuspidato-acuminatae, 8 mm. longae, dorso longius puberulae, sicco fuscae, deciduae. *Inflorescentia* terminalis, corymbiformis, pedunculo communi circa 5 mm. longo incluso ad 5 cm. longa, usque ad 6 cm. lata, rhachi et ramulis breviter pubescentibus, ramulis utrinque 3 supremis brevibus ; bracteae plus minusve deltoideae ; pedicelli breves vel subnulli ; flores pallide virides (ex *Kerr*). *Receptaculum* paulo ultra 1 mm. longum, longius puberulum. *Calycis* tubus brevis, segmenta oblonga, apice rotundato-obtusa, 1.25 mm. longa, 1 mm. lata, dorso longius puberula, ciliata. *Corolla* extra glabra, tubo 2 mm. longo intra apice dense villosa, lobis 6.5 mm. longis 1.25 mm. latis. *Antherae* 5 mm. longae, apiculatae, filamentis brevibus. *Stylus* apicem versus parce pubescens, cum stigmatibus 9 mm. longus ; ovula loculo quoque solitaria.

Prachuap, Pak Tawan, 100 m., light evergreen forest, *Kerr* 20,516.

Tarenna sakae *Craib*, Fl. Siam. Enum. ii. 95 (1932), descr. ampl. [Rubiaceae-Gardenieae] ; inter species calycis segmentis brevibus et corolla extra glabra apiceque rotundata ob folia subtus ad nervorum axillas pilosa et aliter primo pilis distinctis (iis ad nervos persistentibus) instructa distincta.

Frutex circa 2 m. altus (ex *Kerr*) ; ramuli graciles, glabri, cortice cinnamomeo vel cinereo-cinnamomeo obtecti, lenticellis obscuris. *Folia* late oblanceolata vel oblanceolata, apice obtuse subacuminata, basi longius cuneata, 6.5–13 cm. longa, 2.5–4 cm. lata, subrigide chartacea, sicco supra fusciscentia, subtus viridia, supra glabra, subtus ad nervos sparse crispatis puberula, in nervorum axillis pilosa, et aliter setulis brevibus hic et illic instructa, costa supra impressa subtus prominente, nervis lateralibus utrinque circa 10 supra plus minusve conspicuis subtus prominentibus, nervulis obscuris, petiolo 7–12 mm. longo supra canaliculato suffulta ; stipulae ad 1 cm. longae. *Inflorescentia* terminalis, ad 4 cm. longa et lata, fere ex ima basi ramosa, corolla excepta crispatis puberula ; bractae parvae, saepissime deciduae ; pedicelli subnulli vel ad 2 mm. longi. *Receptaculum* 1 mm. longum. *Calycis* tubus 0.5 mm. longus, lobi 0.75 mm. longi, 1 mm. lati, apice rotundati, ciliati. *Corollae* albae (ex *Kerr*) tubus 4 mm. longus, extra glaber, intra apice dense villosus, lobi 5, circa 7 mm. longi et 3 mm. lati, dorso glabri vel ante anthesin apicem versus pauperrime puberuli, intra inferne albo-pilosi. *Antherae* longius apiculatae, 6 mm. longae, filamentis glabris 1 mm. longis. *Stylus* parte dimidia superiore puberulus, cum stigmatibus 13 mm. longus, ovulis loculo quoque solitariis.

Nakawn Sritamarat, Lan Saka, 100 m., evergreen on limestone hill, *Kerr* 15,392.

Tarenna valida Craib, Fl. Siam. Enum. ii. 96 (1932), descr. ampl. [Rubiaceae-Gardenieae] ; a *T. insulare* Ridl. receptaculo calyceque pilis albis adpressis instructis haud minute puberulis, corolla apice haud stellulata recedit.

Frutex circa 2.5 m. altus (ex *Kerr*) ; ramuli primo fusci, compressi, albo-hirsuti, mox pallescentes, teretes, glabri. *Folia* oblongo-elliptica vel elliptica, apice acute acuminata vel subacuminata, basi cuneata, rarius late cuneata, 9.5–17 cm. longa, 3.5–6 cm. lata, rigide chartacea, sicco fusca, supra glabra, subtus ad costam nervosque laterales pilis paucis brevibus plus minusve deciduis instructa, costa supra conspicua interdum impressa subtus prominente, nervis lateralibus utrinque 8–10 supra conspicuis subtus prominentibus intra marginem anastomosantibus, nervulis paucis tantum conspicuis, petiolo 3–7 mm. longo glabro fusco supra parum canaliculato suffulta ; stipulae ad 1 cm. longae, fuscae, glabrae, mox deciduae. *Inflorescentia* terminalis, pedunculo communi ad 3 cm. longo fusco albo-hirsuto suffulta vel saepe ob bracteas primarias foliaceas inflorescentiam sessilem simulans, ad 3.5 cm. longa et 4 cm. lata ; ramuli utrinque saepissime 2, inferioribus circa 1.5 cm. longis, superioribus circa 0.5 cm. longis, cum rhachi albo-hirsuti ; bractae primariae angustae, circa 5 mm. longae vel saepe foliaceae et ad 7.5 cm. longae ; pedicelli breves. *Receptaculum* breviter albo-hirsutum, vix 2 mm. longum. *Calycis* tubus brevis, segmenta lanceolata, acuta, 2 mm. longa, basi 0.75 mm. lata, breviter

albo-hirsuta. *Corollae* tubus extra breviter pubescens, intra superne pilosus, 4.5 mm. longus, lobi ante anthesin 5 mm. longi. *Antherae* 5 mm. longae, filamentis brevibus. *Stylus* basi excepta pubescens, cum stigmatibus 9 mm. longus, ovulis loculo quoque solitariis.

Ranawng, Kao Pawta Luang Keo, 1300 m., open evergreen on ridge, *Kerr* 16,959.

Tarenna viridis *Craib*, Fl. Siam. Enum. ii. 97 (1932), descr. ampl. [Rubiaceae-Gardenieae]; a *T. insulare* Ridl. foliis sicco viridibus subtus hispidulis, calyce et receptaculo densius breviter pubescentibus distinguenda.

Frutex circa 1.5 m. altus (ex *Kerr*); ramuli primo compressi, mox teretes, cito pallescentes, glabri, lenticellis haud conspicuis. *Folia* elliptica, rarius oblonga, apice subacute acuminata vel caudato-acuminata, basi cuneata, 10–19 cm. longa, 4.5–7.8 cm. lata, chartacea, sicco subviridia, subtus parum pallidiora, pagina superiore glabra, inferiore breviter hispidula, costa supra conspicua vel leviter impressa subtus prominente, nervis lateralibus utrinque 8 supra conspicuis subtus subprominentibus saltem supremis intra marginem arcuatim iunctis, nervulis paucis subtus prominulis, petiolo ad 1 cm. longo supra canaliculato suffulta; stipulae ad 8 mm. longae, mox deciduae. *Inflorescentia* terminalis, etiam interdum ex axillis supremis, breviter pedunculata, ad 2.5 cm. longa et 3.5 cm. lata, pedunculo rhachi et ramulis longius puberulis vel breviter pubescentibus; bracteae lanceolatae, acutae, circa 2 mm. longae, puberulae, ciliatae; flores pallide virides (ex *Kerr*), terminalibus sessilibus vel breviter pedicellatis, lateralibus pedicellis ad 3 mm. longis apice bibracteolatis suffultis; alabastra breviter pubescentia, apice breviter stellulata. *Receptaculum* longius puberulum, vix 1.5 mm. longum. *Calycis* tubus brevis, segmenta 5, lanceolata, acuta, 3.75 mm. longa, 1 mm. lata, dorso puberula, intra sericea, ciliata. *Corollae* tubus 3 mm. longus, lobi acuminati, circa 6 mm. longi et 2 mm. lati, inferne cinnamomeo-pilosi. *Antherae* 4.25 mm. longae, acuminatae, filamentis brevibus. *Stylus* basi excepta pubescens, cum stigmatibus 7 mm. longus; ovula loculo quoque 3.

Ranawng, Kapôr, 10 m., evergreen forest, *Kerr* 16,839.

Randia celastroidea *Craib*, Fl. Siam. Enum. ii. 99 (1932), descr. ampl. [Rubiaceae-Gardenieae]; a *R. Griffithii* Hook. f. petiolo glabro, receptaculo haud glabro inter alia recedens.

Arbor 4–5 m. alta—an scandens?—(ex *Kerr*); ramuli glabri, primo sicco atri, mox substraminei vel grisei, spinis paucis rectis 4–6 mm. longis armati. *Folia* oblongo-obovata, rarius oblongo-ob lanceolata vel obovata, apice breviter acute acuminata, basi cuneata, 4.5–10 cm. longa, 2.2–4.5 cm. lata, chartacea, sicco fusciscentia, subtus parum pallidiora, pagina utraque, nisi inferiore in nervorum axillis breviter pilosa, glabra, costa supra impressa subtus prominente, nervis lateralibus utrinque 8 supra impressis subtus prominulis, nervulis paucis subtus prominulis, petiolo 6–12 mm. longo

glabro supra canaliculato suffulta ; stipulae subulato-acuminatae, 5 mm. longae, dorso superne adpresse hirsutae, deciduae. *Cymae* paniculam terminalem foliis multo brevior 2-3 cm. diametro partibus omnibus adpresse hirsutis formantes ; pedicelli breves. *Receptaculum* 1.5 mm. longum, adpresse hirsutum. *Calycis* tubus 1.5 mm. longus, extra adpresse hirsutus, intra glaber, lobi 5, circa 1 mm. longi, extra medio inferne adpresse hirsuti, ciliati. *Corolla* alba (ex *Kerr*) ; tubus 7.5 mm. longus, extra glaber, intra superne fere e medio pilosus ; lobi 5, oblongi, saepe emarginati, 5 mm. longi, 1.5 mm. lati, glabri. *Stamina* ad corollae tubi apicem posita, filamentis vix 1 mm. longis, antheris mucronatis 3 mm. longis. *Stylus* cum stigmatibus circa 1.5 cm. longus, glaber ; ovarium biloculare, ovulis loculo quoque circa 6 in placentam immersis.

Nakawn Sawan, Klawng Kung, 300 m., evergreen forest, *Kerr* 6051.

Randia crassispina *Geddes* apud Craib, Fl. Siam. Enum. ii. 100 (1932), descr. ampl. [Rubiaceae-Gardenieae] ; a *R. fasciculata* DC. foliis floribusque maioribus, calycis lobis haud subulato-acuminatis recedens.

Frutex ad 3 m. altus (ex *Kerr*) ; ramuli spinis crassis rectis ad 1.3 cm. longis armati, pubescentes, primo quadrangulares. *Folia* ovato-lanceolata, apice acuminata, subacuta, basi rotundata, 2.8-9 cm. longa, 1.5-4 cm. lata, chartacea, sicco viridia, subtus pallidiora, supra glabra, subtus ad costam nervosque laterales parce hirsuta et in nervorum axillis pilosa, nervis lateralibus utrinque 6-7 supra conspicuis subtus prominentibus, petiolo 3-6 mm. longo pubescente suffulta ; stipulae cuspidatae, 4 mm. longae. *Inflorescentia* terminalis, compacta, brevis, breviter pedunculata, partibus omnibus hirsuta ; bracteae bracteolaeque lanceolatae ; flores sessiles. *Receptaculum* vix 3 mm. longum, hirsutum. *Calycis* tubus receptaculo subaequilongus, extra hirsutus, lobi 5, circa 1 mm. longi, extra hirsuti, intra glabri. *Corolla* alba (ex *Kerr*) ; tubus 1.3 cm. longus, glaber ; lobi 5, oblongi, obtusi, 7 mm. longi, 3.75 mm. lati, glabri. *Stamina* 5, ad corollae tubi os affixa, antheris mucronatis 4.75 mm. longis. *Stylus* glaber, 8 mm. longus ; stigmata duo, vix 4 mm. longa ; ovarium biloculare, ovulis loculo quoque paucis.

Nawngkai, Chaiyaburi, 200 m., evergreen forest, *Kerr* 8537.

Randia elliptica *Geddes* apud Craib, Fl. Siam. Enum. ii. 100 (1932), descr. ampl. [Rubiaceae-Gardenieae] ; a *R. malabarica* Lamk. floribus multo maioribus differt.

Frutex circa 3 m. altus (ex *Kerr*) ; ramuli spinis axillaribus rectis ad 7 mm. longis armati, pubescentes, griseo-brunnei vel grisei. *Folia* saepissime elliptica, apice et basi rotundata vel saepe apice emarginata, 2-4 cm. longa, 1-2 cm. lata, chartacea, sicco supra fusca, supra subsetuloso-puberula, subtus glabra, nervis lateralibus utrinque 3-5 subconspicuis, margine parum revoluta, petiolo 1-3 mm. longo pubescente suffulta ; stipulae 2 mm. longae, deciduae. *Cymae*

pauciflorae, foliis conspicue minores, pedicellis brevibus bracteolatis. *Receptaculum* 2 mm. longum, hirsutum. *Calycis* tubus 3 mm. longus, extra hirsutus, intra glaber, lobi 5, oblongi, acuminati, 1.5 mm. longi et lati, dorso medio carinati. *Corolla* alba (ex *Kerr*); tubus 5 mm. longus, extra glaber, intra superne densius hirsutus; lobi 5, suboblongi, 8 mm. longi, 3.5 mm. lati. *Stamina* 5, ad corollae tubi os posita; filamenta circa 1 mm. longa; antherae exsertae, mucronatae, 5 mm. longae. *Ovarium* biloculare, ovulis loculo quoque permultis; stigmata exserta.

Nakawn Panom, Tat Panom, 200 m., evergreen scrub by creek, *Kerr* 8422.

Randia fusca *Craib*, Fl. Siam. Enum. ii. 102 (1932), descr. ampl. [Rubiaceae-Gardenieae]; a *R. murina* Craib foliis sicco fuscis tenuioribus haud hirsutis vel tomentosis recedit.

Arbor circa 8 m. alta (ex *Kerr*); ramuli iuvenes sicci fusci, breviter adpresse subsparse pubescentes, annotini glabri, cortice cinereo vel brunneo-cinereo obtecti, lenticellis longitudinaliter extensis conspicuis. *Folia* opposita, paribus inter se inaequalibus vel subinaequalibus, elliptica vel elliptico-ovata, apice acute acuminata, basi saepe parum inaequilateralia, cuneata vel cuneato-rotundata, sub anthesin ad 7 cm. longa et 3.8 cm. lata, sicca fusca, subtus parum pallidiora, sat rigida, supra pilis brevibus ad costam densius, ad nervos laterales sparse, aliter hic et illic iuventute instructa, subtus pilis paululo longioribus similiter instructa et in nervorum axillis pilosa, costa supra conspicua subtus prominente, nervis lateralibus utrinque circa 12 supra conspicuis subtus subprominentibus, nervis transversis pagina utraque plus minusve conspicuis, nervulis rete gracile efficientibus, petiolo ad 1 cm. longo sicco fusco pilis paucis adpressis instructo supra late canaliculato suffulta; stipulae connatae, e basi lata subulato-acuminatae, ad 4 mm. longae, dorso subglabrae, ciliolatae, deciduae. *Corymbi* pedunculo communi brevi incluso circa 3 cm. longi, ad 3 cm. lati, pedunculo cum ramulis breviter adpresse albo-pubescente; bractae parvae; flores albi (ex *Kerr*), pedicellis brevibus vel subnullis suffulti. *Receptaculum* 2.5 mm. longum, fuscum, subglabrum. *Calycis* tubus 1.5 mm. longus, lobi 5, deltoideo-lanceolati, 1–1.5 mm. longi, ciliati. *Corollae* alabastra acuta, apice mox parum stellulata, tubus 6.5 mm. longus, extra albo-subtomentosus, intra superne pilosus, lobi 5, circa 5 mm. longi et 3 mm. lati, glabri. *Antherae* e corollae tubo parum exsertae, apiculatae, 5 mm. longae, medifixae, filamentis brevibus. *Stylus* cum stigmatibus 8 mm. longus, subglaber, sulcatus; ovarium 2-loculare, ovulis numerosis inter maiuscula.

Krabi, Kaw Pipi-le, 50 m., open rocky (limestone) ground, *Kerr* 18,917.

Randia ligustrifolia *Geddes* apud *Craib*, Fl. Siam. Enum. ii. 102 (1932), descr. ampl. [Rubiaceae-Gardenieae]; a *R. malabarica* Lamk. spinis curvatis, floribus maioribus differt.

Ramuli primo pubescentes, mox glabri, cortice cinnamomeo vel griseo obtecti, spinis curvatis 6–8 mm. longis armati. *Folia* anguste elliptica, apice rotundata, mucronulata, basi rotundata vel subcordata, 3.2–5.5 cm. longa, 1.8–3 cm. lata, chartacea, supra fusca, glabra, subtus pallidiora, ad costam parce hirsuta, demum fere glabra, nervis lateralibus utrinque circa 7 subconspicuis, nervulis subobscuris, margine revoluta, petiolo 2–4 mm. longo pubescente suffulta; stipulae 2 mm. longae, deciduae. *Cymae* breves, 3–4-florae, pubescentes. *Receptaculum* circa 2 mm. longum, hirsutum. *Calycis* tubus 3 mm. longus, extra hirsutus, intra glaber; lobi 5, ovati, acuti, carinati, 1.75 mm. longi, circa 2 mm. lati, ciliati, extra hirsuti, intra superne parce adpresse pubescentes. *Corolla* alba (ex *Kerr*); tubus 4.5 mm. longus, basi extra glaber, intra parte superiore barbatus; lobi 5, oblongi, apice obliqui, 8 mm. longi, 3 mm. lati, margine minute ciliati, aliter glabri. *Stamina* 5, ad os tubi corollae affixa, filamentis circa 1 mm. longis, antheris exsertis mucronatis 3.5–4 mm. longis. *Ovarium* 2-loculare, ovulis in loculis multis; stylus 6 mm. longus; stigmata duo, contigua, fusiformia, 3.5 mm. longa, glabra.

Nakawn Sawan, under 50 m., evergreen forest, *Kerr* 5986.

Randia murina *Craib*, Fl. Siam. Enum. ii. 104 (1932), descr. ampl. [Rubiaceae-Gardenieae]; *R. anisophyllae* Jack probabiliter maxime affinis sed foliis minoribus, calycis tubo multo breviora haud ferrugineo facile distinguenda.

Arbor circa 15 m. alta (ex *Kerr*); ramuli primo breviter subhirsuti, fusci, mox glabrescentes, cortice cinereo obtecti, circa 5 mm. diametro, lenticellis haud conspicuis. *Folia* opposita, paribus inter se inaequalibus, ovata vel elliptica, apice acute subacuminata, basi saepissime parum inaequilaterialia, rotundata vel late cuneata, sub anthesin ad 11.5 cm. longa et 6 cm. lata, subcrassa, sicca supra fusco-viridia, subtus murina, supra subhirsuta, subtus tomentosa, costa supra conspicua subtus prominente, nervis lateralibus utrinque circa 12 supra conspicuis subtus subprominentibus, petiolo ad 2 cm. longo hirsuto supra canaliculato suffulta; stipulae late deltoideae, circa 5 mm. longae, fuscae, dorso subglabrae, deciduae. *Inflorescentia* ut videtur saepissime terminalis, corymbiformis, pedunculo communi ad 3 cm. longo incluso ad 6 cm. longa, circa 5 cm. lata, pedunculo cum ramulis et pedicellis breviter hirsuto, pedicellis ante anthesin ad 3 mm. longis, bracteis ad 4 mm. longis, floribus albis (ex *Kerr*). *Receptaculum* circa 2 mm. longum, densius hirsutum. *Calycis* tubus 2.5 mm. longus, subsparse adpresse vel subadpresse hirsutus, lobi 5, deltoidei vel sublanceolati, acuti vel acute subacuminati, 2.25 mm. longi, basi 2 mm. lati, dorso sparse adpresse hirsuti vel fere glabri, ciliati. *Corollae* tubus 8 mm. longus, extra subsericeus, intra superne pilosus, lobi late elliptici, 7 mm. longi, 5 mm. lati, dorso dense hirsuti, supra pilis sparsis instructi. *Antherae* parum exsertae, 5 mm. longae, apiculatae, medifixae,

filamentis brevibus. *Stylus* cum stigmatibus fusiformibus 1 cm. longus, glaber.

Satul, Tung Nui, 100 m., evergreen on rocky limestone hill, *Kerr* 14,651.

Randia mussaendoides *Craib*, Fl. Siam. Enum. ii. 104 (1932), descr. ampl. [Rubiaceae-Gardenieae]; *R. sikkimensi* Hook. f. habitu similis sed floribus conspicue minoribus facile distinguenda.

Arbor circa 15 m. alta (ex *Kerr*); ramuli iuventute sericei, mox plus minusve glabrescentes, cortice cinereo vel brunneo-cinereo obtecti, lenticellis inconspicuis. *Folia* opposita, paribus inter se saepissime inaequalibus, lanceolata, oblanceolata, vel late oblanceolata, apice acute vel obtuse acuminata, basi cuneata, usque ad 16 cm. longa et 4 cm. lata, rigide chartacea, sicca supra fusciscentia, subtus pallide viridia, pagina utraque pilis brevibus albis adpressis sed inferiore ad costam nervosque magis densis instructa, mox plus minusve glabrescentia nisi nervorum axillis subtus pilosis, costa supra conspicua vel impressa subtus prominente, nervis lateralibus utrinque circa 10 supra conspicuis subtus prominulis, nervis transversis pagina utraque conspicuis vel inferiore subprominulis, petiolo ad 1.5 cm. longo suffulta; stipulae 2 mm. longae, dorso sericeae, deciduae. *Paniculae* ad apices ramulorum positae, ut videtur axillares, pedunculo communi ad 1 cm. longo incluso ad 6 cm. longae, pedunculo rhachi ramulis et pedicellis sericeis; pedicelli usque ad 1 cm. longi; bractae parvae; flores lactei (ex *Kerr*). *Receptaculum* sericeum, 3 mm. longum. *Calycis* tubus receptaculo aequilongus, lobi 5, breves. *Corolla* extra sericea; tubus 2 cm. longus, apice 3.5 mm. diametro, intra paulo supra basem villosus; lobi elliptico-oblongi, circa 1 cm. longi et 4.5 mm. lati. *Antherae* sessiles, ad corollae tubi apicem positae, dorsifixae, lineares, acuminatae, 7 mm. longae. *Stylus* 2.5 cm. longus, medio puberulus; stigmata fusiformia, 6 mm. longa.

Krabi, 50 m., evergreen on rocky limestone hill, *Kerr* 18,849.

Randia pilosa *Craib*, Fl. Siam. Enum. ii. 110 (1932), descr. ampl. [Rubiaceae-Gardenieae]; a *R. armigera* K. Schum. foliorum paginae inferioris pilis divergentibus, corollae tubo extra piloso recedit.

Ramuli pilis divergentibus hirsuti, spinis axillaribus rectis circa 8 mm. longis primo subhirsutis armati. *Folia* saepissime oblongo-lanceolata vel lanceolata, apice acute subacuminata, basi cuneata vel rotundato-cuneata, 4-10 cm. longa, 2-3.2 cm. lata, chartacea, sicca supra subfusca, subtus pallidiora, supra ad costam et sparse ad nervos laterales setulosa, setulis mox plus minusve deciduis, subtus ad costam nervosque laterales hirsuta, aliter breviter hirsuta, nervis lateralibus utrinque 8 supra conspicuis subtus prominentibus, nervulis vix conspicuis, petiolo 2-7 mm. longo subhirsuto suffulta; stipulae 3 mm. longae, adpresse hirsutae, deciduae. *Cymae* et axillares et terminales, saepissime triflorae, pedunculo communi

petiolo brevior suffultae; pedicelli circa 4 mm. longi, subsparse hirsuti, basem versus bracteolis duabus oppositis 2 mm. longis instructi. *Receptaculum* 2 mm. longum, pilis divergentibus dense hirsutum. *Calycis* tubus receptaculo subaequilongus, hirsutus, lobi ad 6 mm. longi, hirsuti. *Corollae* tubus 3 cm. longus, apice circa 3 mm. diametro, extra sparse sed conspicue pilosus, intra superne pilosus, lobi 5, suboblongi, 1.6 cm. longi, 5 mm. lati, dorso plus minusve pilosi, supra ima basi pilis paucis brevibus instructi. *Antherae* apiculatae, 8 mm. longae, medifixae, subsessiles. *Stylus* cum stigmatibus crassis 3.3 cm. longus.

Rayawng, Ban Pe, *Put* 2684.

***Randia plumbea* Craib**, Fl. Siam. Enum. ii. 111 (1932), descr. ampl. [Rubiaceae-Gardenieae]; a *R. Griffithii* Hook. f. pedicellis brevioribus, receptaculo haud glabro, floribus minoribus inter alia distinguenda.

Arbor circa 9 m. alta (ex *Kerr*); ramuli glabri, sicco iuventute, virides, mox cortice cinnamomeo obtecti, spinis rectis ad 6 mm. longis interdum armati. *Folia* oblongo-lanceolata, oblonga, vel oblongo-elliptica, apice acute acuminata, basi cuneata, 7–12 cm. longa, 3–4.8 cm. lata, rigide chartacea, sicca supra viridia, subtus plumbea, subtus in nervorum axillis pilosa, aliter glabra, costa supra conspicua subtus prominente, nervis lateralibus utrinque 5–7 supra conspicuis subtus prominulis, nervulis paucis tantum subconspicuis, petiolo circa 5 mm. longo supra canaliculato et margine hirsuto-ciliato suffulta; stipulae lineari-lanceolatae, acutae, 4 mm. longae, deciduae. *Inflorescentia* terminalis, pedunculo communi incluso ad 2 cm. longa; bractae mox deciduae, deltoideae, circa 2 mm. longae, ciliatae; pedicelli ad 4 mm. longi, pilis paucis sed conspicuis adpressis instructi. *Receptaculum* 1.5 mm. longum, pilis paucis adpressis instructum. *Calyx* extra pilis adpressis sparsis instructus; tubus receptaculo subaequilongus; lobi receptaculo subaequilongi, oblongi, cuspidato-acuminati. *Fructus* juvenilis ater, 5 mm. diametro.

Doi Sutep, 1400 m., evergreen forest, *Kerr* 3141.

***Gardenia lineata* Craib**, Fl. Siam. Enum. ii. 119 (1932), descr. ampl. [Rubiaceae-Gardenieae]; a *G. hygrophila* Kurz eiusque affinioribus, receptaculo costato, corolla indumento in lineas disposito extra instructa recedens.

Frutex circa 1.5 m. altus (ex *Kerr*); ramuli hornotini sicco fusci, sparse pubescentes, annotini glabrescentes, mox cortice griseo vel fusco-griseo obtecti, lenticellis parvis rotundatis inconspicuis. *Folia* oblongo-lanceolata vel oblongo-elliptica, apice subobtusata, saepe breviter acuminata, basi cuneata, 3–3.5 cm. longa, 1.2–1.5 cm. lata, sicco fusca, chartacea, pagina inferiore ad nervorum axillas saepe breviter pilosa, aliter glabra, costa supra conspicua subtus prominente, nervis lateralibus utrinque 10 supra conspicuis subtus prominulis intra marginem anastomosantibus, nervulis rete subtus

plus minusve conspicuum formantibus, petiolo ad 2 mm. longo suffulta ; stipulae inter se connatae, circa 8 mm. longae, stramineae, glabrae. *Flores* solitarii, albi (ex *Kerr*), breviter pedicellati. *Receptaculum* costatum, circa 4 mm. longum, glabrum, sicco fuscum. *Calycis* tubus 2 mm. longus, lobi 5, lanceolato-deltoidi, acuti, tubo paululo longiores. *Corollae* tubus 2 cm. longus, parte basali aequali circa 3 mm. longa, superne expansus, extra lineis puberulis cum lobis alternantibus instructus, intra basi supra partem aequalem villosus ; lobi 5, oblongi, apice rotundati, circa 1.3 cm. longi et 1 cm. lati. *Antherae* lineares, 1.2 cm. longae. *Stylus* 2.5 cm. longus.

Nakawn Panom, Ta Uten, 200 m., open ground, *Kerr* 8455.

***Gardenia mamillata* Craib**, Fl. Siam. Enum. ii. 121 (1932), descr. ampl. [Rubiaceae-Gardenieae] ; a *G. campanulata* Roxb. fructu apice mamillata recedit.

Frutex ad 5 m. altus (ex *Kerr*) ; ramuli annotini subcinerei, glabri, paulo compressi, ramulis lateralibus spinescentibus usque ad 6 cm. longis ramulos abbreviatos gerentibus. *Folia* oblongo-elliptica, anguste elliptica, vel elliptico-obovata, 6–11.5 cm. longa, 2–3.7 cm. lata, subacute vel obtuse acuminata, basi cuneata, chartacea, sicco brunnescentia, subtus pallidiora, supra parce hirsuta, mox glabrescentia, subtus ad nervos nervulosque hirsuta, mox nisi in nervorum axillis glabrescentia, costa supra conspicua vel prominula subtus prominente, nervis lateralibus utrinque 6–8 supra conspicuis subtus prominulis intra marginem anastomosantibus, nervis transversis paucis subtus subprominulis, petiolo 3–12 mm. longo supra canaliculato primo parce adpresse hirsuto suffulta ; stipulae deciduae. *Fructus* ellipsoideus vel late ellipsoideus, apice obtuse mamillatus, ad 6.5 cm. longus et 4.5 cm. diametro, sicco maturus stramineus.

Ranawng, Kao Pawta Chongdong, 500–800 m., bamboo forest, *Kerr* 16,750.

***Gardenia truncata* Craib**, Fl. Siam. Enum. ii. 123 (1932), descr. ampl. [Rubiaceae-Gardenieae] ; ab affini *G. sootepense* Hutchinson petiolo brevior, foliis basi truncatis, fructu subrotundato recedit.

Arbor parva, circa 6 m. alta (ex *Kerr*) ; ramuli primo puberuli, resinosi, mox glabri, cortice cinereo obtecti, lenticellis haud conspicuis. *Folia* rotundato-elliptica vel late oblongo-elliptica, apice breviter obtuse acuminata, basi truncata, usque ad 22 cm. longa et 16 cm. lata, rigide chartacea, sicca viridia, subtus pallidiora, supra crasse puberula, subtus ad costam nervos nervulosque breviter submolliter pubescentia, costa supra conspicua subtus prominente, nervis lateralibus utrinque circa 20, inferioribus patulis approximatis, superioribus intra marginem ipsam anastomosantibus, nervulis supra conspicuis subtus subprominulis, petiolo circa 5 mm. longo crasso longius puberulo suffulta ; stipulae intrapetiolares, 13 mm. longae, dorso puberulae, parte basali saepe diu annulatim

persistente. *Flores* axillares, solitarii, breviter pedicellati. *Receptaculum* circa 7 mm. longum, puberulum, 5-costatum. *Calyx* circa 1.5 cm. longus, apice bilobatus, costatus, dorso puberulus. *Corollae* tubus paulo ultra 4 cm. longus, medio 4 mm. diametro, superne parum ampliatus, lobi 5, late elliptici, 2.7 cm. longi, 2 cm. lati, glabri. *Antherae* paulo exsertae, 1.7 cm. longae, medifixae, filamentis brevibus. *Stylus* cum stigmatibus paulo ultra 5 cm. longus, glaber; ovarium uniloculare, placentis duabus. *Fructus* subrotundatus, costatus, ad 2.7 cm. diametro, brunneus, lenticellatus, pedicello 8 mm. longo suffultus.

Kanburi, common in deciduous forest, *Kerr* 20,493.

XXXVII.—TWO NEW SPECIES OF DENTELLA.

H. K. AIRY-SHAW.

Siamese material of what appeared to be a new species of *Dentella* (Rubiaceae-Hedyotideae) was presented to the Kew Herbarium in October, 1931, by Prof. W. G. Craib, who suggested that a revision of the genus might be undertaken. It was found impracticable, with the inadequate material available, satisfactorily to revise the whole genus, but a description of the new species was prepared, and the name, *Dentella serpyllifolia* Wall. ex Airy-Shaw, was forwarded to Prof. Craib. Owing to a misunderstanding this name was published (*Fl. Siam. Enum.* ii. 27: March 1932) before the appearance of the Latin description validating it under the International Rules of Nomenclature.

A full description of the species is now supplied together with its geographical distribution so far as known. The description of a second apparently distinct Asiatic species is appended.

***Dentella serpyllifolia* Wallich** ms. (in sched. in Herb. Wall., sub no. 6206 G) ex *Airy-Shaw*, sp. nov. *D. repenti* (L.) Forst. valde affinis sed ovario fructuque glaberrimo statim recognoscenda.—*D. repens* Hook. f. in Hook. f. *Fl. Brit. Ind.* iii. 42 (1880), pro parte; Ridley, *Fl. Mal. Penins.* ii. 44 (1923), pro parte; non Forst., nec *Oldenlandia repens* L. ? *D. repens* var. *grandis* Pierre ex Pitard in Lecomte, *Flore Gén. Indo-Chine*, iii. 76 (1922). *D. serpyllifolia* Wall. ex Craib, *Florae Siam. Enum.* ii. 27 (1932), *nomen subnudum*.

Herba annua vel perennis, prostrata, diffuse ramosa, habitu omnino *D. repentis*. *Caules* glaberrimi, nodis radicantibus. *Folia* quam ea *D. repentis* plerumque pro rata longiora et angustiora, oblanceolata usque oblongo-obovata, 5–9 mm. longa, 1–2 (rarissime fere 3) mm. lata, basi in petiolum brevem valde attenuata, apice acuta usque obtusa et subrotundata, glaberrima vel rarissime folia iuniora setulis paucis apicem versus ciliata, marginibus levissime revoluti. *Stipulae* ut in *D. repente*. *Flores* solitarii, primum sessiles, demum brevissime pedicellati, e caulis bifurcationibus alternis fere semper orti. *Ovarium* oblongo-ovoideum, glaberrimum, sub anthesin vix 1 mm. longum. *Calyx* tubulosus, membranaceus, glaber, subtruncatus, nervis 5 asperulis in dentes 5 subulatos

hispidulos excurrentibus. *Corolla* alba, ei *D. repentis* similis sed maior, usque 8 mm. longa, lobis subdentatis. *Stamina* et *stylus* generis. *Capsula* sicca, indehiscens, oblique latissime ellipsoïdea usque fere sphaeroïdea, quasi zygomorpha, levissime dorsiventraliter compressa, uno latere (dorsali) ventricosa altero (ventrali) subplana, axi callos praecipui transverse spectans, subtilissime 5-costata, secus septum distincte sulcato-constricta, 2.5 mm. longa, fere 2.5 mm. lata, glaberrima, calyce persistente erecto coronata. *Semina* numerosa, sphaerico-tetrahedrica, testa echinulato-reticulato, castanea.

ORISSA. Mahanadi, 8 May 1850, *Hooker & Thomson*.

NORTHERN BENGAL. Gongachora, 2 May 1809, *Hamilton* in *Herb. Wallich*, Cat. no. 6206 *D*.

LOWER BENGAL. Chittagong Hill Tracts: Kagi-ke-hath, 6 Jan. 1851, *Hooker & Thomson* 433: "Fl. white."

ASSAM. Brahmaputra, *Booth* in *Herb. Nuttall*.

LOWER BURMA. Bank of the Irrawaddi at Henzada, 9 Sept. 1826, *Wallich* 204 (Cat. no. 6206 *G*) (typus in *Herb. Wall.* et *Herb. Kew.*).

SIAM. Krungtep: Bangkok, growing on brick path, 5 Sept. 1920, *Kerr* 4454: "Flowers white."

EAST INDIES: LOMBOK. Ampanam, cult. ground, 1856, *A. R. Wallace*.

MAURITIUS (introd. ?). Curepipe, growing as a weed on railway tracts, *Royal Botanic Garden, Mauritius*, no. 46.

Very close to *D. repens* (L.) Forst., but apparently a distinct species, since no true intermediates have been observed. The absolutely glabrous capsules give the fruiting plant a characteristic appearance. The orientation of the "zygomorphic" ovary in relation to the main and secondary axes seems peculiar in this genus. It is more easily observed in *D. serpyllifolia* than in *D. repens*, owing to the dense covering of hyaline setae in the latter obscuring the shape of the ovary. In the former species the plano-convex or plano-spheric form of the capsule is easily seen. The attachment of the septum is marked by a vertical furrow down the outside of the capsule, on opposite sides. The flowers are borne terminally and almost invariably at alternate nodes, and from these nodes 1 or 2 opposite, lateral branches are given off, one of them usually developing more strongly than the other. In the fruiting stage it is clearly seen that the pedicel, though terminal, is not borne symmetrically: it leans outward, as it were, from the angle formed by the two subtending branches, though the flower itself is erect. The orientation of the ovary (best seen in fruit) is such that the plane of the septum is at right angles to the vertical plane passing through the two opposite lateral branches, and it is the convex side of the fruit which always "leans out" from the fork. This position does not seem to be due to any torsion of the pedicel. A further peculiarity is that the plane of symmetry of the zygomorphic fruit does not coincide with any of the five possible ones of the pentamerous calyx and corolla. The

ribs of the calyx-lobes are faintly but distinctly decurrent down the receptacle, and careful examination of these shows that the calyx is symmetrical in relation to the plane of the two lateral branches, and therefore asymmetrical in relation to that of the receptacle.

I have not seen these features mentioned in any description of the genus hitherto, nor do I know of any parallel example in other Rubiaceae genera. It would be interesting to hear of such cases, if they exist, since they might throw light on the origin and significance of these peculiarities.

The existence of this glabrous-fruited *Dentella* has evidently been known for over a century, since Wallich gave a distinctive name to his 1826 collecting in his Herbarium, though he did not publish it in his Catalogue; and Hooker (*l.c.*) stated that the fruit of *D. repens* might be "hispid or glabrous."

Dentella concinna *Airy-Shaw*, sp. nov.; capsulis glabris *D. serpyllifoliae* Wall. affinis, sed foliis parvis rigidulis confertis subimbricatis costa valida differt.

Herba prostrata, radice perennante. *Caules* graciles, glabri, pro genere parum ramosi, ramis subsimplicibus 2-4 cm. longis; internodia brevia, 1-10 (circiter 5) mm. longa. *Folia* parva, rigida, adscendenti-patentia, nonnunquam imbricata, anguste elliptica usque oblongo-oblancheolata, 2-5 mm. longa, 0.5-1 mm. lata, acuta, basi attenuata, vix vel brevissime petiolata, coriacea, margine revoluta, pagina superiore setis longis albis prorsum spectantibus praesertim marginem versus obsita, pagina inferiore glabra costa valida conspicua. *Stipulae* conspicuae, membranaceae, albidae, deltoideae, apice in setas longas laciniatae. *Flores* ut videtur valde sparsi (an semper?), more generis orti, subsessiles. *Ovarium* oblongum, 1 mm. longum, diametro minore. *Calyx* membranaceus, tubo 1 mm. longo, costis 5 asperulis in dentes subulato-filiformes 0.75 mm. longos apice leviter patulos excurrentibus. *Corolla* infundibuliformis, circiter 6 mm. longa, intus prope stamina pubescens. *Stamina* generis. *Stylus* cum stigmatibus ut videtur longe papillosis 1.75 mm. longus. *Capsula* oblique compresso-sphaeroïdea, circiter 2 mm. diametro, glabra, 5-costata, costa quinta sulcae ventrali proxima et eam fere percurrente, calyce 2 mm. longo dentibus hispidis coronata, brevissime (vix 1 mm.) pedicellata. [*Semina* non scrutata, capsula matura unica tantum in speciminibus praesente.]

LOWER BURMA. Henzada Distr.: Myanaung, Apr. 1872, Gamble 3723 A.

The possibility is not to be excluded that Gamble's collection may be an extreme habitat-form of *D. serpyllifolia* grown under exceptionally dry conditions. A specimen, however, with the setose fruits of *D. repens*, collected presumably under such conditions in the dried-up bed of a lake at Meiktila, Central Burma, does not possess the narrow leaves and remarkably strong midrib, characteristic of *D. concinna*, and appears to be referable with little doubt to

D. repens. For this reason it seems best at present to treat the plant from Lower Burma as a distinct species. Further material is, however, needed (as is the case throughout the genus) before the true status of this plant can be definitely settled.

In conclusion, it may be noted that the genus *Dentella* shows a marked centre of development in the northern, central and eastern parts of Australia. The Kew Herbarium possesses specimens of four or five undescribed species from this region. One or two are clearly allied to *D. minutissima* White et Francis, recently (1922) described from Central Queensland; others are close to *D. repens*, whilst yet others appear to be without obvious allies. The writer would therefore value the opportunity of examining further gatherings from Australia, in order that the new species may be described from adequate material. The collections at present at Kew are mostly somewhat fragmentary.

XXXVIII.—CONTRIBUTIONS TOWARDS A FLORA OF BRITISH NORTH BORNEO: II.* C. E. C. FISCHER.

Ixora lunutica C. E. C. Fischer, sp. nov. [Rubiaceae]; *I. accedenti* Val. proxima, foliorum nervis primariis paucioribus subtus haud elevatis, floribus pedicellatis, calycis lobis acutis, corollae tubo breviorere recedit.

A tree; twigs terete, brown, glabrous. *Leaves* directed forward at a sharp angle with the twigs, narrowly oblanceolate, acuminate, base tapering to the short petiole, glabrous, olive-brown when dry, 10–27 cm. long, 1.6–3.7 cm. wide, midrib and the 14–16 primary nerves prominent below, the latter regular, forming an acute angle (less than 45°) with the midrib, curving slightly and uniting close to the slightly revolute margin; petioles terete, channelled above, 5–7 mm. long; stipules 7 mm. long, shortly and broadly ovate and more or less keeled, the apex produced into a trigonous subulate mucro. *Inflorescence* of terminal, repeatedly trichotomous cymes 16 cm. long, with a pair of much reduced leaves (7 mm. long) and stipules at the first fork; rhachis and its branches compressed below the nodes, glabrous or minutely puberulous; bracts at the forks 2, acuminate, minute; flowers numerous, glabrous, pedicels slender, 4–8 mm. long, each bearing 2 minute bracteoles. *Calyx* turbinate, slightly constricted above the ovary, 1.5 mm. long including the minute, triangular-ovate, acute or subacute lobes. *Corolla-tube* 2.7 cm. long, .5 mm. diam., striate with 8 thick nerves; lobes 4, elliptic-oblong, acute, 7 mm. long, 2.5 mm. wide, twisted clockwise in bud, forming a narrowly fusiform acuminate apex to the tube. *Stamens* 4, seated on the mouth of the corolla-tube, exserted; filaments fleshy, subulate, 1.5 mm. long; anthers linear, abruptly finely acuminate, 3.5 mm. long. *Ovary* 1 mm. long; style very slender, 4 mm. exserted; stigmas oblong-ovate. *Fruit* not seen.

*Continued from *K.B.* 1932, 182.

Lunut, fls. Aug., *Arsat* in Herb. For. Dept. 1259. "Height 40 ft., diam. 1 ft. Flowers white."

Vaccinium adenurum C. E. C. Fischer, sp. nov. [Vacciniaceae]; *V. laurifolio* Miq. affinis, foliis minoribus, racemis longioribus, bracteis majoribus, tubis antherarum truncatis minute glandulosis differt.

A *shrub*; branchlets terete, glabrous, pale-brown, youngest twigs striate, reddish-brown, minutely puberulous. *Leaves* thinly coriaceous, elliptic-obovate, attenuate at both ends, apex obtuse or acute, 3-5.5 cm. long, 1.5-2.6 cm. wide (a few here and there spatulate, 1.5 cm. long), midrib slightly raised below, primary nerves 4-6 pairs, arising at an acute angle from the midrib, arching and anastomosing, reticulations indistinct, quite glabrous, when dry dark-brown and smooth above, paler, wrinkled and obscurely glandular below, margins recurved and sometimes with an immersed gland on one or both sides just above the petiole; petioles flat, 3-4 mm. long, pruinose. *Inflorescence* of terminal and axillary racemes; rhachis angular, up to 10 cm. long, minutely puberulous, with several deciduous minute, ovate, pungently acuminate mucronate, puberulous scales at the base; bracts deciduous or some persisting till the corollas fall, membranous, subsessile, narrowly oblanceolate, attenuate at both ends, apex acute, minutely puberulous, 1.5-2 cm. long; flowers numerous; pedicels 5-7 mm. long, minutely puberulous. *Calyx* broadly campanulate, 2.2 mm. long; lobes 5, broadly ovate, abruptly acute, 1 mm. long, minutely ciliate. *Corolla* tubular, slightly inflated at the middle, contracted at the mouth, glabrous without, furnished with scattered short white hairs within, tube 5-6 mm. long; lobes 5, triangular, obtuse, reflexed, 1 mm. long, minutely grey-papillose within. *Stamens* 10, epigynous, free; filaments linear-ensiform, base inflexed, 3.5 mm. long, pilose; anthers oblong, muriculate, spurs 0 or minute, the terminal tubes truncate, erose, sparsely minutely glandular. *Disc* dome-shaped, 5-lobulate, glabrous. *Ovary* 5-celled, ovules several in each cell; style compressed, 5 mm. long, pilose below, minutely grey-papillose above, truncate. *Fruit* not seen.

Sandakan, on hill near catchment area, fls. Nov., *G. Pascual* in Herb. For. Dept. 1219. "Height 10 feet, diam. 4 in. Flowers white."

Embelia philippinensis A.DC. [Myrsinaceae].

Pin River, fls. Sept., *Arsat* in Herb. For. Dept. 1241. "Fl. white." Orang Sungei name: *Sabiliken*. Without precise locality, *D. D. Wood* 2123.

Diospyros borneensis Hiern [Ebenaceae].

Gaya, Gov. *Creagh*.

Diospyros cauliflora Bl. [Ebenaceae].

Banguay Island, *P. Castro et F. Melegrito* 1379.

Diospyros elliptifolia Merr. [Ebenaceae].

Banguay Island, *P. Castro et F. Melegrito* 1666.
forma **kinalabuensis** Bakh.

Kinabalu, 3000 ft., *G. D. Haviland* 1322.

Diospyros Enderti Bakh. [Ebenaceae].

Without precise locality, *D. D. Wood* 1305.

Diospyros Everettii Merr. [Ebenaceae].

Kudat, fls. Feb., *Dr. M. Fraser* 203.

Diospyros Helferi C. B. Clarke [Ebenaceae].

Without precise locality, *D. D. Wood* 1964.

Diospyros Korthalsiana Hiern [Ebenaceae].

Banguay Island, *P. Castro et F. Melegrito* 1706.

Diospyros lanceifolia Roxb. forma **consanguinea** (Merr.) Bakh.
[Ebenaceae].

Kinabalu, Jesselton, *M. S. Clemens* 9600.

Diospyros maritima Bl. [Ebenaceae].

Port Myburgh, *Gov. Creagh*; Kudat, *Dr. M. Fraser* 80.

Diospyros pendula Hasselt. [Ebenaceae].

Kudat, *Dr. M. Fraser* 201.

Diospyros tuberculata Bakh. [Ebenaceae].

Banguay Island, *P. Castro et F. Melegrito* 1409.

Jasminum triandrum C. E. C. Fischer, sp. nov. [Oleaceae]; ab omnibus ceteris speciebus staminibus 3 recedit; *J. celebico* Merr. proximum, a quo nervis foliorum primariis paucioribus, bracteis majoribus, floribus numerosioribus et majoribus differt.

A woody climber; twigs terete, glabrous except for the brownish-puberulous upper nodes. *Leaves* opposite, simple, distichous, ovate-lanceolate, tapering to a fine point, base rounded, 3.5–7.5 cm. long, 1.2–3.2 cm. wide, midrib slightly impressed above, prominent below, primary nerves pennate, 4–5 pairs, the upper 1 or 2 pairs obscure, looping and anastomosing near the margin, reticulations obscure, quite glabrous, fuscous-brown when dry; petioles slender, curved upwards, 7–10 mm. long, channelled above, articulated below the middle and minutely puberulous below the articulation, base widened, the two opposite petioles joined by a raised line. *Inflorescence* terminal and from the upper axils; peduncles compressed, glabrous, the lower ones up to 3 cm. long, gradually shorter upwards; cymes trichotomous, rather dense-flowered, the ultimate divisions 1-flowered, or more usually 2–5 in umbels, often with much reduced lanceolate or linear-lanceolate, acuminate and petiolate leaves, acute at the base, at the forks; partial rhachises sometimes puberulous, bracteoles linear or linear-spathulate, up to 1 cm. long, glabrous; pedicels rather stout, 3–3.5 cm. long. *Calyx-tube* cupular, 2–2.5 mm.

long; lobes 6, linear-acicular, 5-7 mm. long, glabrous, minutely ciliate. *Corolla-tube* 1.4-1.6 cm. long; lobes 8-9, linear-oblong, finely acuminate, 9-10 mm. long. *Stamens* 3; filaments short, flat; anthers linear, apiculate, 3-3.5 mm. long. *Ovary* ellipsoid, 1 mm. long, glabrous; style slender, as long as the corolla-tube, glabrous. *Fruit* not seen.

Lundan, 100 ft., fls. June, *Md. Tahir* in Herb. For. Dept. 1313. "In forest. Flowers white." Malay name: *Bunga Malur-hutan*.

Three stamens in a *Jasminum* is very unusual. Several flowers were dissected and every one was tri-staminate.

***Alstonia angustiloba* Miq. [Apocynaceae].**

Sandkan, 80 ft., fr. Feb., *H. G. Keith* in Herb. For. Dept. 1271; fls. Sept., *H. G. Keith* in Herb. For. Dept. 1321 (both specimens from same tree). "Tree 50 ft. high, 40 in. diam; fls. white, fr. pale-green." Vernacular name: *Pulai*.

***Avicennia alba* Bl. [Verbenaceae].**

Nabakan, Weston, fls. Oct., *Md. Tahir* in Herb. For. Dept. 1232. "In swamp." Malay name: *Api-Api*.

XXXIX.—BOTANICAL NAMES OF LAVENDER AND SPIKE. M. L. GREEN.

As the result of an enquiry from the Pharmaceutical Society, an historical investigation was undertaken by the writer into the nomenclature of Lavender and Spike with the following results:—

(1) The name *Lavandula Spica* as originally published by Linné included both Lavender (as var. α), and Spike (as var. β).

(2) The name *L. Spica* was presumably given by Linné with reference to "*Spica recentiorum*" Lobel. Hist. 235 (vide Linn. Hort. Cliff. 303) i.e. Spike, and it was adopted by the following botanists for that species when it was separated from Lavender: Chaix (1786); De Candolle (1815); Gingins (1826); Bentham (1833, 1848); in most recent pharmaceutical works also, the name *L. Spica* has been applied to Spike.

(3) When a species originally composed of varieties is broken up into two or more species it is generally assumed, in the absence of evidence to the contrary, that var. α is the type of the specific name, that is, the element for which the name should be retained in the event of segregation. Hence numerous botanists have retained the name *L. Spica* L. for the Lavender; e.g. Loiseleur (1807); Nyman (1881); Briquet (1891, 1896); Schinz & Thellung (1923); Rehder (1927).

(4) It has been shown by Sprague, however, that in various cases the type of a Linnean specific name was not his var. α (*Rhodora*, xxx. pp. 55-56: 1928).

(5) In view of the name *L. Spica* L. having been used in numerous standard floras for Spike and in others for Lavender, it is now

wholly ambiguous unless the words "emend. Chaix" or "emend. Loisel." are added whenever it is mentioned.

It was decided at the International Botanical Congress held at Cambridge in 1930 that "a name of a taxonomic group must be rejected if, owing to its use with different meanings, it becomes a permanent source of confusion or error," and that a list of "nomina ambigua" should be prepared by the Executive Committee of Nomenclature. The name *Lavandula Spica* L. is here suggested for inclusion in the list. If it is treated as a "nomen ambiguum," the correct name for Lavender is *Lavandula officinalis* Chaix and that of Spike is *Lavandula latifolia* Vill.

The more important synonymy of the two species is as follows :—

LAVENDER.

Lavandula officinalis Chaix in Vill. Hist. Pl. Dauph. i. 355 (1786); Vill. l.c. ii. 363 (1787); Ard. Fl. Alp.-Marit. ed. 2, 296 (1879); Parl. Fe. Ital. vi. 56 (1884); Rouy & Fouc. Fl. France, xi. 254 (1909); Tschirch, Handb. Pharmakogn. ii. 823 (1912); Finne-more, Essential Oils, 707 (1926); Hegi, Ill. Fl. Mittel-Eur. v. 2277 (1927).

L. Spica Linn., var. α , Linn. Sp. Pl. 572 (1753).

L. Spica Linn. emend. Loisel. Fl. Gall. ii. 346 (1807); Bertoloni, Fl. Ital. vi. 74 (1844); Nyman, Consp. Fl. Eur. 572 (1881); Briq. Lab. Alp. Marit. 464 (1891); Briq. in Engl. & Prantl, Nat. Pflanzenfam. iv. 3A, 228 (1896); Fiori & Paoletti, Fl. Ital. iii. 18 (1903); Schinz & Thellung, Fl. Schweiz, ed. 4, i. 556 (1923); L. H. Bailey, Man. Cult. Pl. 641 (1924); Rehder, Man. Cult. Trees & Shrubs, 780 (1927).

L. angustifolia Moench, Meth. 389 (1794).

L. vera DC. Fl. France, vi. 398 (1815); Gingins, Hist. Nat. Lavand. 145 (1826); Benth. Lab. Gen. & Spec. 148 (1833); De Notaris, Rep. 347 (1844); Benth. in DC. Prodr. xii. 145 (1848); Masters in Treas. Bot. 664 (1866); Willk. & Lange, Prodr. Fl. Hisp. ii. 391 (1870); Benth. & Trimen, Med. Pl. iii. t. 199 (1880); Flückiger, Pharmakogn. Pflanzenr. ed. 3, 811 (1891); Coste, Fl. France, iii. 78 (1904); Greenish, Mat. Med. ed. 2, 95 (1909), et Greenish, l.c. ed. 5, 89 (1929).

SPIKE.

Lavandula latifolia Vill. Hist. Pl. Dauph. ii. 363 (1787); Loisel. Fl. Gall. ii. 346 (1807); Willk. & Lange, Prodr. Fl. Hisp. ii. 392 (1870); Ard. Fl. Alp.-Marit. ed. 2, 296 (1879); Nyman, Consp. Fl. Eur. 572 (1881); Parl. Fl. Ital. vi. 59 (1884); Briq. Lab. Alp.-Marit. 469 (1891); Briq. in Engl. & Prantl, Nat. Pflanzenfam. iv. 3A, 228 (1896); Fiori & Paoletti, Fl. Ital. iii. 19 (1903); Coste, Fl. France, iii. 78 (1904); Rouy & Fouc. Fl. France, xi. 255 (1909); Tschirch, Handb. Pharmakogn. ii. 831 (1912); L. H. Bailey, Man. Cult. Pl. 641 (1924); Finne-more, Essential Oils, 718 (1926); Rehder, Man. Cult. Trees & Shrubs, 780 (1927); Hegi, Ill. Fl. Mittel-Eur. v. 2276 (1927).

L. Spica Linn., var. β , Linn. Sp. Pl. 572 (1753).

L. Spica Linn. emend. Chaix in Vill. Hist. Pl. Dauph. i. 355 (1786); DC. Fl. France, vi. 397 (1815); Gingins, Hist. Nat. Lavand. 151 (1826); Benth. Lab. Gen. & Spec. 149 (1833); De Notaris, Rep. 347 (1844); Benth. in DC. Prodr. xii. 145 (1848); Masters in Treas. Bot. 664 (1866); Flückiger, Pharmacogn. Pflanzenr. ed. 3, 814 (1891); Greenish, Mat. Med. ed. 2, 96 (1909), et Greenish, l.c., ed. 5, 89 (1929); Sprague & Nelmes in Journ. Linn. Soc., Bot. xlviii. 326 (1931).

XL.—INEZIA, A NEW GENUS OF COMPOSITAE FROM SOUTH AFRICA. E. P. PHILLIPS.

Inezia E. P. Phillips, gen. nov., affinis *Lidbeckiae* Berg., sed floribus radii fertilibus, bracteis apice scariosis, et pappo minuto differt.

Planta 30–60 cm. alta, villosa. *Caules* erecti. *Folia* sessilia, integra. *Capitula* solitaria, heterogama, floribus radii 1-seriatis fertilibus, disci \varnothing fertilibus. *Involucrum* campanulatum, bracteis pauciseriatis imbricatis, interioribus apice scariosis. *Receptaculum* conicum, nudum. *Corollae* radii ligulatae, involucro aequilongae; \varnothing regulares, 4-angulares, 4-fidae. *Antherae* basi obtusae, integrae. *Styli* rami fl. \varnothing apice truncati. *Achaenia* anguste oblonga, anguste alata.

Inezia integrifolia (Klatt) E. P. Phillips, comb. nov.—*Lidbeckia integrifolia* Klatt in Bull. Herb. Boiss, sér. 1, iv. 840 (1896).

TRANSVAAL: Barberton distr.; Dry range at Moodies, 5000 ft., Feb., *Thorncroft* 452*, 453, and in *Herb. Wood* 4948*; Saddleback Mt., 4000 ft., Nov. & Dec., *Galpin* 1174; Near top of mountain behind Barberton, 5000 ft., Feb., *Liebenberg* 2420; Lydenburg distr.; open veld near Graskop, 4760 ft., Jan., *Irvine* in Nat. Herb. 11,421.

SWAZILAND: Near Mbabane, 5000 ft., Dec., *Bolus* 12,012; 4600 ft., Jan., *Burt Davy* 2868.

As formerly constituted, the genus *Lidbeckia* consisted of three species, two from the south-western districts of the Cape Province, and the third from the Transvaal and Swaziland. The last species, which Klatt placed in the genus *Lidbeckia*, not only differs in some important characters from the Cape plants, but also occurs in quite a different floral region, and there is, therefore, justification for regarding it as a distinct genus. The two species from the Cape are more or less branched, semidecumbent, undershrubs, with divided leaves. The plant under consideration has a perennial underground stem, from which stiff, erect, leafy branches arise, and the leaves are entire. It further differs from the type species of *Lidbeckia* in that the ray-flowers are scarcely longer than the involucre-bracts, which, more especially the inner ones, are

*Klatt quotes *Thorncroft* 552 and 4958, whereas the numbers should be as above.

truncate and membranous at the tips ; the ovary of the disc-flowers does not break away from the corolla with an attached shoulder, as in *Lidbeckia*, but comes away clear, and then shows a very minute crown-like pappus. The genus has been named in honour of Miss Inez C. Verdoorn, on the staff of the National Herbarium, Pretoria.

XLI.—MISCELLANEOUS NOTES.

THE DIRECTOR has been honoured by being elected a Corresponding Member of the Deutsche Botanische Gesellschaft at the meeting held on May 18th, 1932. At the same meeting DR. O. STAPF, F.R.S., already a Corresponding Member, was elected an Honorary Member of the Society.

Hackelia macrophylla (Brand) Johnston. This species was treated originally as a variety of *Cynoglossum uncinatum* Benth. In Fl. Brit. Ind. iv. 161, it was united with *Paracaryum glochidiatum* Benth. and has been much confused with that species in herbaria. In Fedde, Rep. xiv. 146-147 (1915), Brand showed that neither of these two species is a true *Paracaryum* and placed them in the genus *Lappula* Gilib., making the new combination *Lappula glochidiata* and describing the variety as a new species *Lappula macrophylla*.

In 1923, Johnston (Contr. Grey Herb. new series, lxviii. 43) pointed out that the usual conception of *Lappula* comprises two sharply differentiated groups of plants and proposed to revive the genus *Hackelia* Opiz for the biennial or perennial species, the nutlets of which have a large ovate or deltoid areola, leaving in *Lappula* the annuals whose nutlets are attached by a narrow areola extending all along the medial ventral keel. In this view both the species under review fall in *Hackelia*. Johnston, however, correctly rejected the specific name *glochidiata* of Wall, as a *nomen nudum* on a Wallichian sheet not validated by any description (vide art. 37 of the International Rules), and substituted the trivial *Roylei*, after *Cynoglossum Roylei* G. Don, Syst. iv. 356 (1838). In his revision of the family in Pflanzenr. Borraginac.-Cynogloss. 119-120 (1931), Brand accepts the transfer to the genus *Hackelia* but retains the incorrect trivial *glochidiata*. As pointed out in K.B. 1925, 319, *Cynoglossum uncinatum* Benth. in Royle Ill. 305 is the earliest valid name for the plant, as the part containing the description appeared in 1836. The correct name for the species, therefore, is **Hackelia uncinata** (Benth.).

Brand in the two publications cited has shown the characters distinguishing the two species, but Mr. B. O. Coventry, who has had the opportunity of studying both in Kashmir, has brought the following additional points to my notice :—

H. uncinata : One or two pairs of nerves in the leaves above the basal continued in an even, practically uninterrupted curve to near the apex, upper surface of the leaves asperous ; nutlets with the glochidia in usually two marginal rows (one row in occasional, reduced nutlets) and the faces devoid of glochidia ; corolla blue.

H. macrophylla: All the nerves soon forking and anastomosing, upper surface of leaves smooth; nutlets with glochidia spread over the whole face; corolla white with a purple blotch at the sinus between the lobes.

H. macrophylla does not appear to extend as far East as *H. uncinata*, the following localities being represented in the Kew Herbarium, besides several sheets collected by T. Thomson attributed to "Him. Bor. Occ." without more precise localisation; Hatta, T. Thomson; Murree, Top of Mt. Mokshpuri A.F.; Yarkand Expedition, Dr. Henderson; Kumaon, Ralam River, 11,500 ft., Strachey and Winterbottom 6; W. Him., Pangee, Dr. Watt; Kulu Lahoul, near Pulga, J. R. Drummond 22,963; Kashmir, Aru, 9000 ft., J. R. Drummond 14,116; Mirga, 9200 ft., Chitral Relief Expedition 17,353; Jaunsar, Chachpur, 7000 ft., J. S. Gamble 23,692; Tehri Garhwal, Bamsu and Murali, 6500-8500 ft., fl. and fr. May-June, J. S. Gamble 24,217, 24,792, 24,947; Punjab, Changla Forest, fl. and fr. July, Miss E. M. Saunders, "Grows near water in woods. Flowers white or pale-pink with pink centre"; Chitral, Ziarat, 8000 ft., S. M. Toppin 431; Kashmir, Badwan, 7500 ft., fl. July, B. O. Coventry 1488. C. E. C. FISCHER.

Ruyschia phylladenia Sandwith.—The description of this species (see K.B. 1930, 153) was incomplete since the petals and stamens had fallen and none were to be found with the herbarium material. Mr. C. H. Lankester, who discovered this interesting plant at Las Cóncavas, Cartago, Costa Rica, at an attitude of 4800 ft., has kindly presented to Kew a fine flowering raceme preserved in spirit. The description of the species may therefore be amplified as follows:—

Petala obovata usque anguste obovata, 7 mm. longa, 3-4 mm. lata, libera, sub anthesi reflexa. *Stamina* 3, 5-6 mm. longa; filamenta complanata, supra basin ad 1.2 mm. lata, sursum angustata, basi petalis manifeste adhaerentia, inter se libera; antherae suborbiculari-ovatae, 1 mm. longae, 0.8 mm. latae. *Ovarium* biloculare, globosum, 2 mm. longum atque diametro, stylo manifesto cum stigmate subintegro 1.5 mm. longo.

The most interesting features of the flower of this species, as will at once be seen by students of the *Marcgraviaceae*, are the choripetaly and the presence of three stamens. These characters immediately suggest the transference of *R. phylladenia* to the genus *Caracasias* Szysz., which was originally described by Ernst as *Vargasias*, a name which had to be abandoned under the International Rules of Nomenclature. *Vargasias* was distinguished from *Ruyschia* (*sensu latiore*, including *Souroubea*) by the possession of 3 instead of 5 stamens, which were free instead of adnate to the petals at the base; by the bilocular, instead of quinquelocular, ovary; and by the biconvex lamina of the nectaries. The two last characters were subsequently found to be worthless, since *Ruyschia* Jacq. *sensu*

stricto has, in fact, a bilocular ovary, and the lamina of its nectaries is more or less biconvex. Subsequent authors, therefore (Szyszylovicz and, more recently, Gilg and Werdermann, in Engler and Prantl, *Pflanzenfamilien*) have distinguished *Caracasias* from *Ruyschia* on the number of the stamens, and the freedom of the petals and stamens, the petals of *Ruyschia* being said to be connate at the base, and the 5 stamens connate and adhaerent to the petals.

But dissection of the flower of the type species of *Ruyschia*, *R. clusiifolia* Jacq., shows that neither the 5 stamens nor the petals are connate. The 5 broad filaments are adnate to the petals at the base and meet each other at this point, but they are not connate; and several of them are so placed towards the side of the petal that they appear to be alternate with, rather than opposite to, the petals. Thus the filaments partly adhere to and partly overlap the petals, and the result is that the petals tend to appear fused at the base, although in reality they are free.

In *R. phylladenia*, which has the 3 stamens of *Caracasias*, although its general facies is exactly that of *R. clusiifolia*, the filaments are adnate to the petals at the base and inserted at the side rather than in the centre, precisely as in *R. clusiifolia*. The petals always appear perfectly free, since the filaments, being fewer in number, do not meet each other nor tend to create an appearance of fusion.

R. phylladenia, therefore, disagrees with Ernst's description of *Vargasias* (*Caracasias*), since the 3 stamens are not free from the petals. There is no material of *Caracasias* at Kew. The genus was based on two species discovered near Caracas, *C. tremadena* (Ernst) Szysz. and *C. viridiflora* (Ernst) Szysz. Of these the former has the leaves rounded, the latter subcordate at the base, and in both species the free part of the nectary is situated at the apex of the pedicel. Thus it is clear that *R. phylladenia* is distinct from both species of *Caracasias*, not merely in its stamens which are adnate to the petals at the base, but also in its shorter leaves which are attenuate at the base, and in the lamina of its nectary which arises from above the middle of the pedicel but at some distance from the apex.

Although no material of *Caracasias* has been available for examination, the above remarks would seem to suggest that the genus is not really separable from *Ruyschia*. If the stamens of *Caracasias* are truly free, then *Ruyschia phylladenia* is a connecting link between the two genera. Meanwhile, it does not seem desirable to place *R. phylladenia* in *Caracasias* merely on account of its three stamens.

N. Y. S.

Conifers in Cultivation.*—This book of 634 pages is the official report of the Conifer Conference, organised by the Royal Horticultural Society, held in the Society's Hall in Greycoat Street, Westminster, in November 1931.

*Conifers in Cultivation: The Report of the Conifer Conference held by the Royal Horticultural Society, November, 1931. Price £1 1s. 0d. net from The Secretary, Royal Horticultural Society, Vincent Square, London, S.W.1.

Forty years had passed since the Society held their previous Conference, and in the intervening years so much additional knowledge had been gained about Conifers and their cultivation, and so many new species had been introduced, that an opportunity for collating and distributing information had become necessary.

Quoting from the report, p. 2, "The principal objects of the Conference were to collect experiences regarding the many coniferous plants introduced as a result of expeditions to China, N. Burma, Tibet, etc.; to revise the conclusions on the cultural possibilities of various Conifers as stated at the last Conference; to gather together the changes that have become necessary in nomenclature; and to collect statistics of the growth in the British Islands of coniferous trees and, so far as possible, compare the statistics with those obtained 40 years ago." To gain these ends a number of papers on varied subjects were prepared for reading at the Conference and these papers, with the discussions that ensued, appear in the report. Statistics concerning the various species grown in some 250 gardens situated in different parts of the British Isles were obtained, and they form an important section of the work—pp 329–596. Unfortunately the statistical comparisons with trees measured 40 years ago could not be made, for in very few instances was it possible to find trees that were measured in 1891; some had died standing, others had been blown down, while in many instances estates had changed hands and no record had been kept of the measured trees.

The book begins with a list of the Executive Committee and a definition of the objects of the Conference, followed by the Opening Address given by the Hon. Henry McLaren, C.B.E., President of the Royal Horticultural Society. The next 300 pages are devoted to papers and discussions, the first paper being a Reference List of Conifers grown out of doors in the British Isles. The list is made up from the names sent in with the statistical returns; many of those names are obsolete and the Conference was considered to be a favourable opportunity for directing attention to the names now recognised as correct according to the International Rules of Botanical Nomenclature. By means of different kinds of type correct names and synonyms are clearly defined. The list is prefaced by explanatory matter regarding the necessity for name changes, and at the beginning of each important genus its distinctive characters are given.

The papers read on the first day and their readers were:—"The Influence of Exotic Conifers on Silviculture in the British Isles," by Sir John Stirling Maxwell, Bart., K.T.; "Random Notes on Diseases of Conifers," by Professor Dr. Borthwick, O.B.E.; "Dwarf Conifers," by Mr. Murray Hornibrook. On the second day Mr. L. B. Stewart, A.H.R.H.S., dealt with "Propagation of Conifers"; Mr. A. D. Slavin, M.S., read a paper on "Some Conifers cultivated in the United States"; Dr. L. Cockayne, C.M.G., F.R.S., wrote on "Polymorphy in New Zealand Conifers and its Relation to

Horticulture"; Mr. A. C. Forbes dealt with "Some Problems connected with the Natural Reproduction and Survival of New Zealand Conifers"; Mr. F. R. S. Balfour, M.A., F.L.S., V.M.H., gave "The History of Conifers in Scotland and their Discovery by Scotsmen"; the Marquess of Headfort contributed "Conifers in the Parks and Gardens of Ireland"; and Mr. E. L. Hillier described "Conifers of the Temperate Regions of the Far East."

On the third day Mr. A. B. Jackson, A.L.S., contributed "Notes on Chinese Conifers"; Mr. W. Dallimore dealt with "The Economic Value of the Coniferae"; Professor H. E. Armstrong, F.R.S., gave "Conifer Chemistry"; Mr. H. M. Gardner "Conifers of Kenya"; and Mr. C. E. Legat, B.Sc., "Exotic Conifers in South Africa." All these papers are given in full and several are illustrated by numerous excellent photographs. Following the papers there is a list of the exhibitors, and between that and the statistical returns a selection of the most notable trees in cultivation, of a large number of species, is given. As the statistical returns were received they were examined, and where a name did not correspond with the name now recognised as correct, the correction was made, the sender's name being given first in italics, followed by the correction in small Roman capitals. A Bibliography of Conifers, compiled by Mr. H. R. Hutchinson, and an excellent index completes what will be found a most useful book by all who are interested in coniferous trees and shrubs. The important work of editing was carried out by Mr. F. J. Chittenden, F.L.S., V.M.H., and he is to be congratulated upon the results, for he had a by no means easy task. W. D.

Botanical Magazine.—The third part of Vol. clv. was published on May 26th and contains the following plant portraits and some descriptions of new species:—

Rhododendron Kyawii Lace & W. W. Smith (t. 9271), from the rain-forest belt of Upper Burma; *Acarpha laciniata* Stapf, comb. nov. (t. 9272), found on the eastern slopes of the Andes near Lake Nahuel Huapi and formerly known as *Boopis laciniata* Ball; *Petrocosmea Parryorum* C. E. C. Fischer (t. 9273), collected by Mr. and Mrs. Parry in the Lushai Hills, Assam; *Aerides Jarckianum* Schlechter (t. 9274), a native of the Philippine Islands; *Pourthiaea villosa laevis* Stapf, comb. nov. (t. 9275), a rosaceous shrub, with many synonyms, introduced some seventy years ago from Japan; *Primula alpicola* Stapf (t. 9276), a new species, allied to *P. sikkimensis* Hook. f. and *P. Florindae* Ward, with cream-coloured or purple flowers from Kongbo Province, Tibet—a useful key to the allied species follows the description; *Camellia cuspidata* Hort. (t. 9277), a handsome free-flowering shrub common in the Yangtse-Kiang Valley from western Anhwei to eastern Szechuan, Chekiang, originally discovered in 1886 by Augustine Henry; *Calceolaria acutifolia* Witasek (t. 9278), introduced in 1900 by Mr. A. K. Bulley from the Patagonian Andes; *Iris Polakii* Stapf forma *protonyma*

(t. 9279), a native of North-Western Persia ; *Nothopanax arboreus* Seemann (t. 9280), a tree found throughout the New Zealand Islands, and *Berberis Francisci-Ferdinandi* C. K. Schneider (t. 9281), discovered by E. H. Wilson in the mountains of Western Szechuan.

A Second Biology.*—This volume is the second of a series of three textbooks designed to cover a course in biology up to the standard of Higher School Certificate and similar examinations. The authors emphasize in the preface the need of first-hand observation of living organisms in biological teaching and this principle is well carried out in the text, in which a greater number of types is described than is usual in such books. There is an excellent chapter on plant and animal ecology and throughout special attention is paid to organisms as living entities.

That the authors possess the gift of clear exposition is well illustrated by the sections on Meiosis and the dehiscence of the Fern sporangium, processes always difficult to describe satisfactorily in an elementary textbook.

In placing Pooh Bah's "Primordial Protoplasmic Atomic Globule" at the base of their hypothetical scheme of life the authors betray a sense of humour rarely met with in a biological textbook.

The index might well have been more carefully compiled ; there is no mention of pollination or seed dispersal, though these subjects are treated in the text. This, however, is a small blemish in a book which should prove acceptable to all teachers of Biology.

Flora of the Prairies and Plains of Central North America.†

—Botanists studying the flowering-plants and ferns of the north-eastern United States have long had two excellent manuals at their disposal, namely, Gray's New Manual of Botany, and Britton and Brown's Illustrated Flora of the Northern States and Canada. Small's Flora of the South-eastern United States covers the south-eastern area while Jepson's Manual of the Flowering Plants of California and Abrams' Illustrated Flora of the Pacific States are available for the western States. The Rocky Mountain region was covered by the late Dr. Rydberg's Flora of the Rocky Mountains and adjacent plains, and the lacuna remaining between east and west is now filled by the volume under review. It aims to be "a complete manual of the Spermatophyta and Pteridophyta of the States of Kansas, Nebraska, Iowa, Minnesota, South Dakota, and North Dakota, and of Southern Manitoba and south-eastern Saskatchewan" and includes descriptions of 1066 genera and 3988 species. There is no Introduction, but an account of the phytogeography of the area

*By S. Mangham, M.A. and W. Rae Sherriffs, M.A., D.Sc., F.L.S. London, Sidgwick & Jackson, Ltd., 1931, pp. vii+367, 197 figures. Price 6s.

†By Per Axel Rydberg, New York. Published by the New York Botanical Garden, 1932, pp. vii.+969, figs. 600. 8vo. Price \$5.50 post paid.

was published in Brittonia, i. 57-66, a few months before the author's death, and Latin diagnoses of the new species and the single new genus, *Denslovia* (based on *Habenaria clavellata* Spreng.) appeared in a posthumous paper (l.c. 79-III). Various changes in nomenclature have been made in order to conform with the International Rules.

The only satisfactory test of a work of this nature is to use it for identifying a number of unknown plants. Here it must suffice to say that the keys seem to be clear, with adequately contrasting characters, and that the descriptions are short but helpful. The format and style are attractive. Misprints are commendably few, but *Hypochoeris radicata* appears as "*H. radiata*." The large number of plants naturalized from Europe and Asia is a feature which the region of the prairies and plains shares with the north-eastern area. In Brassicaceae (Cruciferae) alone, over forty species are included as adventive or naturalized from the Old World, or occur as escapes from cultivation. As might be expected, these are not so well described as the native species: *Barbarea stricta*, for example, being inadequately distinguished from *B. vulgaris*. But on the whole, considerable care seems to have been taken in drawing up the descriptions, and the work will be welcomed by all those interested in the flora of the region. The author's taxonomic tendencies are reflected in his segregation, from the Liliaceae, of the families Melanthiaceae, Calochortaceae, Alliaceae, Convallariaceae, Dracaenaceae, Trilliaceae and Smilacaceae.

T. A. S.

Ledger Bark and Red Bark.—In the article on this subject, published in *Kew Bulletin*, 1932, No. 1, the quotation from King's Manual of Cinchona Cultivation in the fourth paragraph on page 10, commencing "In 1886 the Nilgiri plantations . . .", should read "In 1866 . . .".

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